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U.S. Department of the Interior
Bureau of Land Management
Rock Springs District Office

Green River and Kemmerer Resource Areas July 1995

Environmental Assessment for Sodium Leasing in the Green River Basin of Southwestern Wyoming

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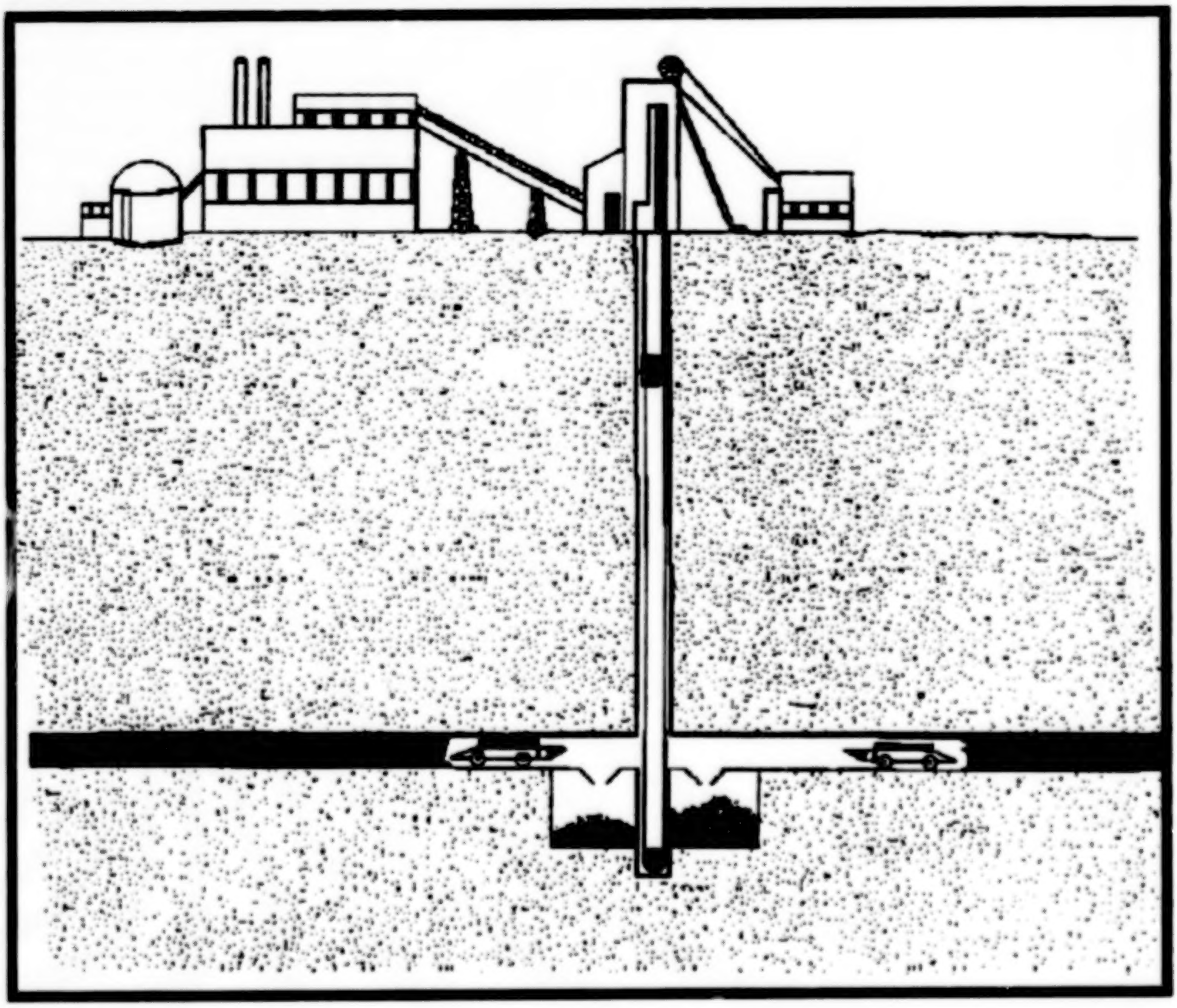

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The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield; a combination of uses that take into account the long term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific and cultural values.

BLM/WY/PL-95/013+1300

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Rock Springs District Office
P.O. Box 1869
Rock Springs, Wyoming 82902-1869

3520 (412c)
Trona

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Dear Reviewer:

The enclosed environmental assessment is provided to you for your review and comment. The assessment analyzes the potential impacts of leasing seven tracts (9,893.91 acres) of the publicly owned sodium resource in southwest Wyoming. The BLM has included a reasonable development scenario to help determine the significance of potential impacts should development of the resource lead to construction of new underground mines.

This environmental assessment was prepared pursuant to the National Environmental Policy Act, and other regulations and statutes, to address potential impacts to the human environment and to solicit public comments. This environmental assessment is not a decision document. Its purpose is to inform the public about potential impacts that may result from leasing the sodium resource.

Your comments are welcome. Comments are due to the BLM no later than August 15, 1995. Please submit your comments to:

Ted Murphy
Chief, Support Services
Bureau of Land Management
P.O. Box 1869
Rock Springs, Wyoming 82902-1869

If you have any questions concerning this proposal, please feel free to contact Ted Murphy by visiting the District Office or calling 307-382-5350.

Sincerely,

Ronald P.

District Manager

ACTING

Enclosure

ENVIRONMENTAL ASSESSMENT

FOR

SODIUM LEASING

GREEN RIVER BASIN, WYOMING

PREPARED BY

BUREAU OF LAND MANAGEMENT
ROCK SPRINGS DISTRICT
GREEN RIVER RESOURCE AREA
KEMMERER RESOURCE AREA

JULY 1995

WY-048-EA-95-106

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CHAPTER I

PURPOSE AND NEED

INTRODUCTION

Trona is a natural resource of national as well as international importance. Trona deposits within the Rock Springs District are the world's largest commercial source of natural soda ash (produced from trona). Soda ash is used in the production of a wide range of consumer items including glass, chemicals, baking, and cleaning products.

As public land administrators, the BLM assures that this resource, as with all mineral resources located on public land, be developed in the best interest of the American public. In keeping with this policy, the BLM is proposing to hold a sodium lease sale of seven tracts (see Chapter II for legal descriptions) incorporating a total of 9,893.91 acres. Map 1 provides location of the proposed lease tracts.

The scoping notice issued earlier to the public also identified three additional tracts (2,560 acres) as available for leasing. These tracts were analyzed in the Sodium Mineral Lease Sale Environmental Assessment and approved for leasing in the associated Decision Record of 1992. Leasing of these tracts will not result in the construction of a new mining facility but will accommodate expansion of existing underground mining operations. Thus, these specific tracts will not be analyzed further in this document other than with analysis of the cumulative impacts. These three tracts may be offered for leasing sometime in 1995.

Federal sodium leases are issued based upon a system of closed competitive bids. The highest bidder may receive the lease provided the bid meets or exceeds fair market value. These leases have a 20-year primary term with discretionary 10-year renewal periods thereafter. A federal sodium lease is not automatically renewed but may be renewed upon the lessee's timely request for renewal. All leases adjudicated for renewal are reviewed and the lease terms, conditions, and special stipulations may be changed or modified to conform with current policy and regulations.

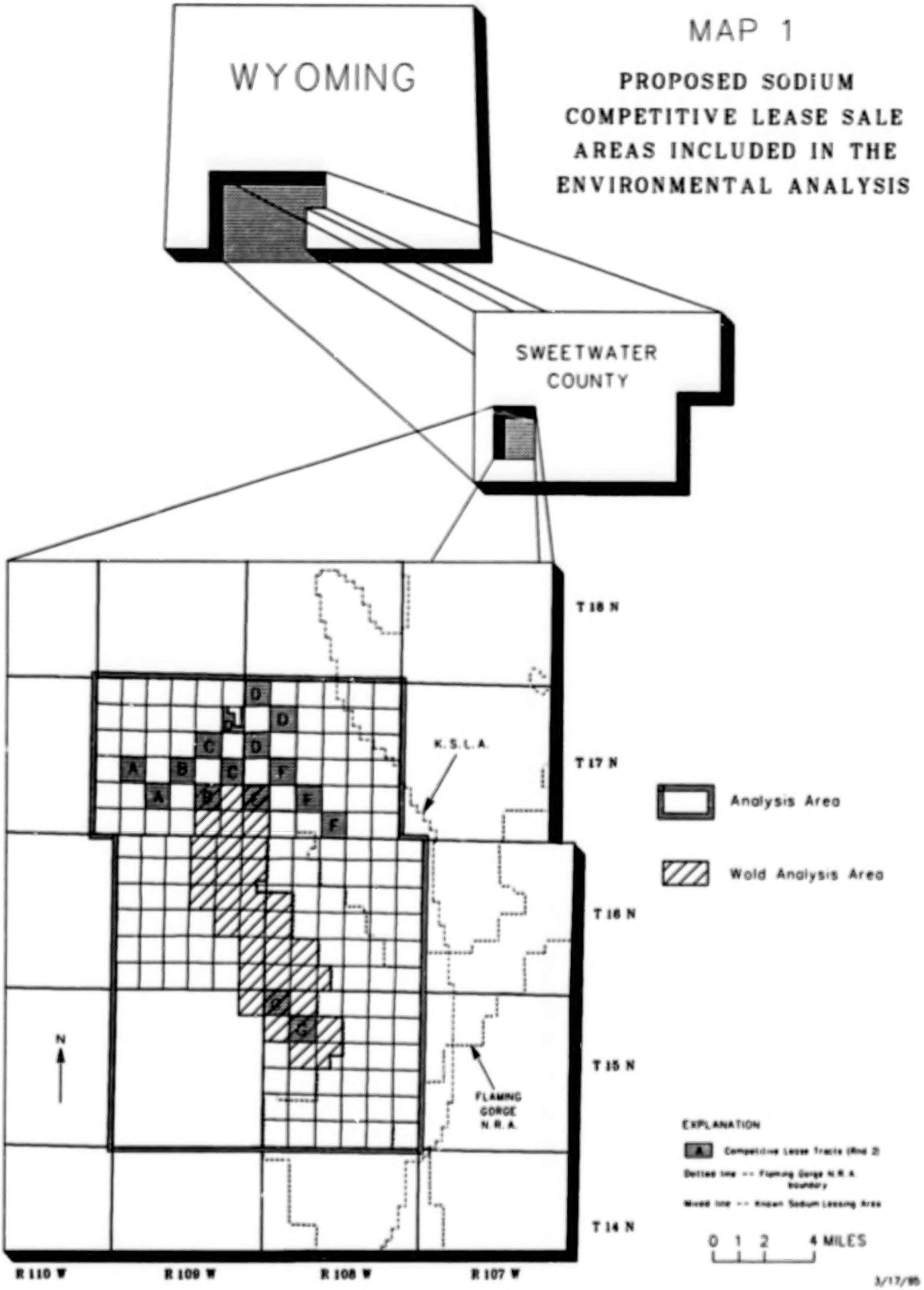
The act of leasing is an administrative process that does not impact the human or natural environment. However, when a lease is issued, it entitles the holder to explore for and produce commercial quantities of the leased mineral. Thus, impacts occur during development of the leased mineral. The BLM will address likely impacts of potential development in this analysis.

NEED AND PURPOSE

Based upon industry requests, the BLM proposes to lease additional tracts of sodium from southwest Wyoming deposits in a timely and orderly manner that would maintain existing soda ash production and would allow for expansion of production to meet projected domestic and foreign demands for soda ash. This action would promote healthy competition within the soda ash industry and would ensure a fair market return to the public while assuring environmentally sound development.

MAP 1

PROPOSED SODIUM COMPETITIVE LEASE SALE AREAS INCLUDED IN THE ENVIRONMENTAL ANALYSIS



Ultimate recovery of this resource requires ownership or control of an area of several contiguous sections. Since federal minerals are interspersed with private mineral ownership within the checkerboard land pattern in most of the trona deposition area, issuance of federal sodium leases has been and will continue to be a factor in the recovery of both federal and private trona reserves.

The purpose of this assessment is to determine whether the special stipulations attached to the proposal are adequate to prevent undue and unnecessary degradation to the environment. This EA will also serve as a biological assessment for potential development. The U.S. Fish and Wildlife Service (FWS) will be given the opportunity to comment on the adequacy of the impact analysis.

CONFORMANCE WITH LAND USE PLANS

Leasing of trona is allowed for and in conformance with the following land use plans:

Kemmerer Resource Management Plan Environmental Impact Statement and Record of Decision (1986) - The Kemmerer Resource Management Plan (RMP) covers a portion of the land identified for leasing. The RMP states that all unleased public lands within the Green River Basin Known Sodium Leasing Area (KSLA) are available for leasing consideration.

Green River Resource Management Plan and Draft Environmental Impact Statement (1992) - The Green River Resource Area RMP Draft Environmental Impact Statement, No Action Alternative, covers the eastern portion of the land identified for leasing. The No Action Alternative represents the current management guidance provided by the Salt Wells Management Framework Plan and describes the current leasing policy of maintaining the objective for providing both short- and long-term sodium development in an orderly and timely manner. The KSLA is and will remain open to exploration, leasing, and development of the trona resource.

Ashley National Forest Land and Resource Management Plan, Environmental Impact Statement, and Record of Decision (1986) - The Flaming Gorge National Recreation Area is covered by the Ashley National Land and Resource Management Plan and EIS. The forest plan prescribes management direction for lands contained within the National Recreation Area (NRA). No lands within the NRA are affected by this proposal; however, some recreation lands are within the area of analysis and portions of several proposed lease tracts lie adjacent to the recreation area.

This plan generally allows for multiple use including mineral development. Any development of leased tracts adjacent to the NRA would be coordinated with the Ashley National Forest, Flaming Gorge NRA, officials.

Lease Stipulations - The stipulations described in Chapter II include special stipulations on occupancy and are in addition to the standard federal lease terms. These stipulations are designed to protect surface resources such as visually sensitive areas, soils, vegetation, water, and wildlife by restricting periods of activity or areas of disturbance.

Use Authorizations - Any lease development will be subject to permits from the Wyoming Department of Environmental Quality (WDEQ) - Land Quality Division, Air Quality Division, Water Quality Division - and the Industrial Siting Council. In addition, permits from the Wyoming Department of Transportation, Sweetwater County Board of County Commissioners, U.S. Army Corps of Engineers, and the Wyoming State Engineer may be required. BLM use authorizations (i.e., leases, rights-of-way, permits, etc.) for processing plant facilities, roads, powerlines, pipelines, and rail spurs will be processed through the usual application permitting process and would be subject to further, in-depth environmental analysis.

RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

The Proposed Action of holding a trona lease sale of seven tracts is in conformance with the following:

Sodium Mineral Development Environmental Assessment and Revised Decision Record (1983) - The proposed tracts occur within the area covered by this sodium development EA (Sodium EA) which approved additional exploration, leasing, and development within the KSLA. This analysis tiers to the sodium development EA.

Wold Trona Company Underground Trona Mine Project Environmental Assessment and Decision Record (1994) - This analysis tiers to the Wold Trona Company EA (Wold EA) with respect to possible future development. The Wold EA provides the latest information of likely development scenarios for the proposed lease tracts. Any foreseeable mine development would closely resemble the size of the Wold operation.

Mineral Leasing Act of 1920 (30 U.S.C. 262) - Federal sodium deposits are leased under the authority of the Mineral Leasing Act of 1920, as amended (MLA). This Act was passed to promote the development of certain mineral resources and to obtain a reasonable financial return to the public for removal of the mineral resources on federal lands.

Mining and Minerals Policy Act of 1970 (43 U.S.C. 1702 PL 91-631) - This Act states that it is in the national interest of the United States to foster and encourage private enterprise in the development of an economically sound and stable domestic mining program, and to promote the orderly and economic development of domestic mineral resources.

Federal Land Policy and Management Act of 1976 (PL 94-579) - The Federal Land Policy and Management Act of 1976, as amended (FLPMA) mandates that the public receive fair market value for the use of public lands and its resources.

National Materials and Mineral Policy Research and Development Act of 1980 (PL 96-479) - This Act mandates an adequate and stable supply of materials necessary to maintain national security, economic well-being, and industrial production with appropriate attention to a long-term balance between resource production and a healthy environment.

Final Land Use Plan of Sweetwater County, Wyoming - This local land use plan encourages environmentally responsible development within Sweetwater County.

COMPLIANCE WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

To meet the National Environmental Policy Act (NEPA) and the Council on Environmental Quality regulations implementing the Act, this EA is being prepared and made available to the public for review and comment before BLM makes a decision. This EA will also address cumulative impacts of this proposal with all past, present, and foreseeable future actions within the analysis area (see Map 12).

Based upon internal and external scoping, the BLM has identified the following resource issues to be analyzed in this EA:

- Potential impacts to surface and sub-surface water resources, including possible impacts to wetlands, riparian, and floodplain areas pursuant to Executive Orders 11990 and 11988, if development occurs.

- Co-development conflicts, particularly with oil and gas leasing, exploration, and development within potential mining units.

- Potential impacts to soils and possible erosion due to potential development.

- Potential impacts of one or two new mining operations on existing producers.

- Potential impacts to and protection of recreational activities at Flaming Gorge National Recreation Area (NRA), along the Blacks Fork River, the Green River, Devil's Playground WSA, historic trails, and other historic properties.

- Potential impacts of possible development on wildlife: crucial antelope winter range, raptors, sage grouse, prairie dog towns, big game utilization patterns, and possible poaching and harassment of wildlife. Potential for degradation of water quality due to possible development that could negatively influence the health and vitality of game and non-game fish species. Impacts to threatened, endangered, candidate plant and animal species, and to Wyoming State priority 1 bird and mammal species, and migratory birds of high national interest.

- Potential impacts of possible development on cultural resources.

- Potential impacts of possible development on local communities.

In addition to those issues mentioned above, two issues identified by the public are outside of the scope of this EA. The first issue is that leasing would reduce the trade deficit. Although export of soda ash is beneficial to the overall economy, the trade deficit is so large that BLM can not make any predictions regarding the level of impact of future potential development (and export of soda ash) on the future trade deficit at this time. The second issue outside of the scope of this EA is resolution of an existing exchange proposal. This document deals specifically with leasing of the trona mineral. Exchanges are outside the scope of the document.

CHAPTER II

PROPOSED ACTION AND ALTERNATIVES

PROPOSED ACTION

In response to industry requests for competitive sodium leasing, the BLM proposes to hold a competitive sodium lease sale on 9,893.91 acres of public land and minerals in the following sections (refer to Map 1).

Lease Tract A
T. 17 N., R. 109 W., Sections 20 and 28 (1,280 acres)

Lease Tract B
T. 17 N., R. 109 W., Section 22 and 26 (1,280 acres)

Lease Tract C
T. 17 N., R. 109 W., Sections 14 and 24 (1,193.60 acres)

Lease Tract D
T. 17 N., R. 109 W., Section 12 (401.63 ac)
T. 17 N., R. 108 W., Sections 6, 8, and 18 (1,910.36 acres)

Lease Tract E
T. 17 N., R. 108 W., Section 30 (638.80 acres)

Lease Tract F
T. 17 N., R. 108 W., Sections 20, 28, and 34 (1,920 acres)

Lease Tract G
T. 15 N., R. 108 W., Sections 6 and 8 (1,269.52 acres)

Leasing of these tracts would be subject to the stipulations outlined below in addition to standard lease terms. The standard lease terms are shown in Appendix A.

Four sections (three lease tracts) previously proposed for leasing were analyzed in an environmental assessment and approved for leasing December 8, 1992. Thus, the following tracts will not be analyzed further in this document other than in conjunction with cumulative impacts. These tracts will be offered for sale sometime in 1995.

Lease Tract 1
T. 18 N., R. 109 W., Section 20 (640 acres)

Lease Tract 2
T. 18 N., R. 109 W., Section 28 (640 acres)

6

Lease Tract 3

T. 17 N., R. 110 W., Sections 10 and 12 (1,280 acres)

ALTERNATIVES

No Action Alternative

Analysis of the "No Action" alternative was addressed in the Sodium Mineral Development EA. The Decision Record identified federal lands within the KSLA as open to sodium leasing. Existing facilities and development of existing leases would continue to occur under this alternative. However, those lease tracts identified under the Proposed Action would not be offered for sale at this time.

ALTERNATIVES CONSIDERED BUT DROPPED FROM FURTHER ANALYSIS

Alternative A

An analysis of the current situation of the trona/soda ash industry, including world demand and supply, can be found in Appendix B. Based upon this analysis, the BLM has dropped from consideration this alternative which would have reduced the number of acres/tracts offered within this competitive sale. The situation analysis shows that offering all tracts for lease is justified from a demand stand point. Existing mining operators are expanding production and it is anticipated that soda ash demand in developing nations will continue as the standard of living improves. Environmental concerns associated with production of synthetic soda ash will continue to escalate.

OTHER ALTERNATIVES

One alternative considered but dropped from further analysis includes holding a lease sale in another area. This alternative was dropped from detailed analysis because the proposed lease tracks were nominated by industry and are the most likely to receive competitive bids which thereby promotes the BLM's objective of orderly and timely development of the trona resource to meet national and export needs.

Another proposal considered but dropped from further analysis included analyzing a no leasing alternative. This alternative was dropped because it would not be in conformance with existing land use plans and would be contrary to the Decision Record of the Sodium Mineral Development EA which specifically allows for consideration of leasing proposals.

LEASING

Sodium leases would be issued for an initial 20-year term, subject to preferential right to renewal every 10 years thereafter. The proposed lease area is within both the KSLA and an oil shale withdrawal area.

At this time, it is expected that portions of the leases would be underground-mined within 10 to 15 years. The development of these leases could result in the construction of up to two new conventional underground mines and surface processing facilities to manufacture soda ash from the mined trona.

LEASE PROVISIONS

Royalty Rate

In 1993, an analysis of the royalty rate for new and renewed sodium leases within the Green River Basin was completed. The analysis, findings, and recommendations were presented to the State Director of Wyoming in July 1993. The analysis was then forwarded to the Washington Office. The Assistant Secretary and the Director are presently reviewing the analysis and evaluating the recommended options and alternatives. Thus, all existing and future leases will be subject to the final royalty rate decision.

Diligence

As part of the royalty rate analysis, diligence for sodium leases was also addressed. A review of federal sodium lease development within the KSLA indicated that reasonable diligence was not being exercised on the majority of the federal leases. To insure that the public resource was not being held for reasons other than development, a diligence stipulation was proposed for inclusion on all new and renewed sodium leases. A diligence requirement will enable those who wish to develop the resource to obtain reserves in the future. The leasing needs of those who wish to promote, market, and develop the public resource will be met through future lease sales. The ability to maintain federal sodium leases will be impaired by the diligence requirement, if reasonable diligence is not exercised. The Assistant Secretary and the Director are presently reviewing this issue and evaluating recommended options and alternatives. All leases will be subject to a diligence stipulation, if approved.

Coincidental Development

Portions of the proposed sodium lease tracts were previously leased for oil and gas. The BLM interprets this to mean that the oil and gas lessee would have first right to develop the oil and gas resource if the oil and gas lease was issued before the trona lease. In other words, operations may be approved which, in the opinion of the authorized officer (AO), would not unreasonably interfere with the orderly development and/or production of a mineral under a prior existing lease issued upon the same lands.

The Joint Industry Committee (JIC) made up of representatives from the oil and gas industry, sodium industry, the Wyoming Mining Association, the Petroleum Association of Wyoming, the State of Wyoming, Union Pacific Resources, and the BLM are presently studying the effects associated with coincidental trona and oil and gas development. Through a test program, the JIC will collect technical information about the interaction of trona mining and oil and gas production to help industry participants, mineral owners, and regulatory agencies resolve conflicts that may arise from development of both mineral resources.

A technical solution to the question of how close mining operations can be conducted to a producing oil and gas well, will enable the industries to design and implement some form of a drilling island. It has been proposed that an area (island) be set aside under which mining would not be allowed. Within the islands, wells could be developed to reach the surrounding gas reserves by using directional drilling (see Figure 1). The JIC expects to have an alternative to the BLM policy ready for review, approval, and implementation by June 1998.

Other Stipulations

All leases approved for sale will be subject to the following special stipulation in addition to the standard lease terms and conditions:

A. Surface Occupancy Criteria

1. Under the terms of the Endangered Species Act of 1973, the lessee shall conduct surveys to determine if special status species or their habitats are present in proposed areas, and alternative areas, for surface disturbance regardless of land ownership. If it is determined that special status species could be affected, appropriate consultations shall be conducted between the BLM, FWS, WGFD, and the proponent. No activities shall be authorized until the consultation is complete as specified by Section 7(c) of the Endangered Species Act. The Biological Opinion issued by FWS as a result of the consultation process shall specify mitigation measures to be carried out by the proponent.

2. No aboveground facilities (power lines, storage tanks, fences, etc.) would be allowed on or within a 1/4 mile radius of active sage grouse strutting grounds. Linear disturbances such as low-traffic roads, pipelines, seismic activity, etc., could be granted exceptions. Activities would avoid the area within 1/4 mile radius of active strutting grounds from sunset to 9 a.m. daily from February 1 through May 15. Seasonal restrictions would be applied within an additional 1.75 mile radius from leks to protect sage grouse nesting habitat. Exceptions to seasonal restrictions may be granted.

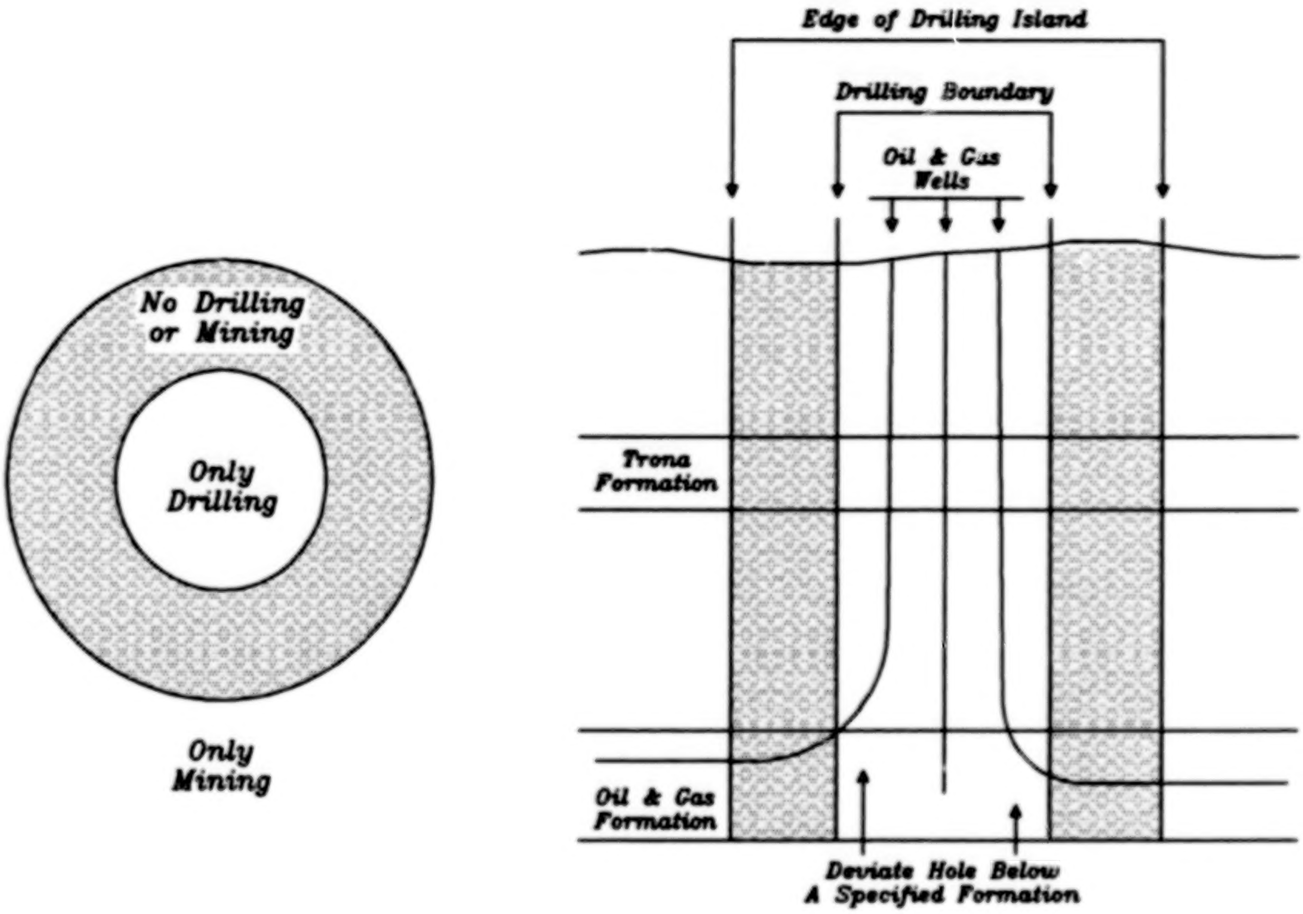
3. Nesting raptors would be protected by restricting activities within 1/2 mile to 1 mile radius of active or historic raptor nesting sites (depends on species). Active or historic raptor nesting sites would be protected and managed for continued nesting activities.

4. No surface occupancy is allowed within 1/4 mile, or visual horizon, of either side of significant portions of historic trails and associated sites for the purpose of protecting these historical values (actual distance varies with topography) unless authorized by the AO.

5. No surface occupancy is allowed within one-half mile of either side of the Flaming Gorge Reservoir and the Green, Blacks Fork, and Hams Fork rivers for the purpose of protecting water quality. Exceptions for ancillary facilities may be authorized by the AO.

6. No surface occupancy shall be permitted on the areas within the Flaming Gorge National Recreation Area which are classified as retention by the Forest Service's visual management system. These areas are shown on the Forest Service's Visual Planning Map, available at the Manila, Utah office.

7. Limit surface occupancy within the areas of Flaming Gorge National Recreation Area which are classified as partial retention areas by the Forest Service's visual management system. Mineral leases would be allowed in these areas provided the visual, environmental, and recreational values can be protected and mineral activities remain subordinate to the characteristic landscape. The lessee would be required to coordinate development proposals with personnel from Flaming Gorge National Recreation Area in order to assure potential impacts to the recreation area are mitigated to an acceptable level.



Note: Drilling Island Dimensions (size) have not been determined yet.

Drilling Island Concept

Figure 1

8. Locate plant facilities where they would not significantly degrade air quality over the Flaming Gorge NRA; or cause heavy fog conditions that would be significant hazards to public health, such as black icing of major highways, or such as extreme and continual fog that could inhibit transportation or recreation activities.

9. In regard to big game crucial winter habitat, construction activities of short-term duration (i.e., six months or less) shall be subject to season-of-use restrictions. No surface occupancy for such short-term duration construction activities shall be allowed from November 15 to April 30 unless approved by the AO.

10. No surface occupancy is allowed within certain lambing and high-value livestock grazing areas unless authorized by the AO. In cases where loss of such habitat is unavoidable, off-site enhancement projects may be required by the AO.

11. Any plant, mill, tailings pond, and sewage lagoon will be at least one-mile from existing perennial waters, unless otherwise authorized by the AO.

12. The lessee shall be required to pay the value of the royalty due on salable sodium products which would have been produced from any trona left unmined, without approval of the AO, which should have been recovered under the approved mine plan and which is otherwise lost or left economically inaccessible by mechanical techniques.

13. Operation will not be approved which, in the opinion of the AO, would unreasonably interfere with the orderly development and/or production from a valid existing mineral lease issued prior to this lease for the same lands.

B. Other Mitigation

1. Surface uses such as processing plants and tailings ponds which result in long-term loss of wildlife habitat may require the enhancement of habitat and habitat manipulation off-site as determined by the BLM AO. Types of improvements would include, but are not limited to, seeding, prescribed burning, guzzler/water development, plantings, and fencing.

2. Tailings pond reclamation experiments shall be conducted.

3. Prior to undertaking any surface-disturbing activities on the lands covered by a lease or permit, the lessee or permittee, unless notified to the contrary by the AO, shall:

   a. Contact the appropriate BLM office or the appropriate surface management agency where the surface of the lands are administered by such agency, through the BLM, to determine if a site-specific cultural resource/survey/inventory is required.

   b. If a cultural survey is required the lessee or permittee shall fund and engage the services of a qualified cultural resource specialist acceptable to the federal surface management agency to conduct an intensive inventory for evidence of cultural resource values. A report of such survey shall be approved by the AO of the surface management agency and the BLM.

c. Fund and implement mitigation measures required by the surface management agency to preserve or avoid destruction of cultural resource values. Mitigation may include relocation of proposed facilities, testing, and salvage or other protective measures. Where impacts cannot be mitigated to the satisfaction of the surface management agency, surface occupancy on areas with significant cultural resource values could be prohibited.

d. The lessee or permittee shall immediately bring to the attention of the AO of the federal surface management agency or BLM any cultural resource or any other object of scientific interest discovered as a result of surface operations under this lease. No disturbance of such discoveries will be allowed until the lessee or permittee is directed to proceed by the BLM.

4. Prior to construction the lessee or permittee shall contact the appropriate BLM office or appropriate surface management agency to determine if a site-specific paleontological resource/survey/inventory is required. If a survey is needed, the lessee or permittee will provide a qualified individual approved by the BLM to conduct the survey. If paleontological resources are discovered in the course of construction or excavation, the activity will cease and the BLM AO notified. The company will provide a qualified individual approved by the BLM to collect and remove the fossils.

5. The permittee or lessee shall avoid any operation when the ground is muddy and/or wet. The BLM AO may prohibit exploration, drilling, or other activities during wet or heavy snow periods where compliance with Wyoming DEQ-Water Quality Division storm water discharge permit requirements are not being met. Any damages will immediately be reported to the AO for reclamation procedures.

6. Centerline survey and construction designs will be submitted to and approved by the AO prior to road construction.

7. Construction of roads with frozen earth material (mixed with snow and ice) shall not be allowed.

8. All embankment fill material for reservoir dams should come from within the reservoir areas. Borrow pits will not be required unless special materials are necessary, such as clay for backfilling a core trench. If a separate fill area is utilized, after the fill is removed the area will be stabilized.

9. Whenever possible, a portable mud pit shall be used when drilling with fluids. Where this is not possible, the pit shall be rehabilitated immediately following the drilling operation.

10. If drilling platforms or mud pits are constructed, at least six inches of topsoil or useable soil material will be removed and saved and spread over disturbed areas after completion of operations, unless otherwise specified by the AO.

11. Access other than casual use across public lands to the lease area will require authorization through either the issuance of a right-of-way (ROW) or an on-lease authorization.

12. All prospecting activities including, but not limited to, drilling operations, water hauling, various vehicular traffic, etc., shall be restricted to the permitted area and/or the area authorized in the ROW.

13. All proposed water sources will be identified to the BLM.

14. Coordination with the U.S. Forest Service will be conducted prior to any development within or adjacent to their administered lands.

15. The BLM and State Engineer's Office shall be notified in writing if black water or flowing artesian wells are encountered during exploration/drilling operations.

16. All drill holes will be plugged in accordance with the State of Wyoming Land Quality Rules and Regulations, and in particular W.S. 35-11-404.

17. All drainages will be kept open to allow free water movement. Road crossings shall be designed so they do not cause excessive erosion.

18. Road drainage crossings shall be designed so they will not cause siltation or accumulation of debris in the drainage crossing nor shall the drainages be blocked by the road bed. Whenever possible, streambank crossings on major drainages should be constructed with the bank feathered back on a 45 degree horizontal angle or less to avoid siltation.

19. Discharge of water on public lands will not be permitted without permits from DEQ and authorization from the BLM.

20. Existing roads to streams, rivers, or reservoirs will be used whenever possible to minimize disturbance, channelization, or runoff.

21. Plant sites will be designed for "zero discharge concept" through the use of containment ponds.

22. The lessee will demonstrate that the proposed tailings pond area is or would be made impervious to seepage.

23. Tailings ponds will be designed to withstand two consecutive 100-year floods. This includes the use of diversion canals or ditches to intercept natural runoff and divert drainages below tailings ponds area.

24. A contingency plan for tailings pond failure will be prepared for BLM and DEQ approval.

25. During shaft excavation, any ground water encountered will be grouted off and sealed.

26. Culverts shall be designed with necessary energy dissipation devices, that will handle at least a 25-year flood event, and/or that comply with WDEQ flood standards. Proper size culverts or bridge structures will be installed at each drainage crossing. Design plans will assure that the culvert installed will be capable of handling the volume of flow without being washed out. The lessee will submit for BLM's approval the type of structure and dissipation device design prior to installation.

27. The company or its operator will indicate in their development plans locations of drainage crossings along with the type of structure (culvert, arch bridge, etc.) proposed to be approved by the AO.

28. Temporary streambank stability structures may be required on a case-by-case basis where access roads cross stream channels or parallel steep cutbanks and fill slopes. Cribbing or retaining structures on constructed slopes in unstable soil steeper than 2 to 1 ratio may also be required.

29. Five days prior to any construction/drilling activities on a lease or permit area, a preconstruction conference will be held with the AO or his representative. Those attending will be the lessee or permittee and all his contractors or agents involved with construction/drilling activities on the lease or permit.

    Prior to holding of the work conference, the permittee or lessee shall submit a construction/exploration plan containing but not limited to the following:

    a. A hydro-geologic study addressing the hydraulic characteristics of aquifers (especially those high in sodium content) that may be affected by drilling/construction activities.

    b. Quantity and quality of ground water.

    c. A detailed plan of access to all proposed drill sites.

    d. A detailed schedule of drilling, showing the sequence of drilling and approximate dates.

    e. A reclamation plan of disturbed areas and sites.

    f. A wildlife enhancement plan.

    g. This plan should be submitted at least 15 working days prior to the work conference.

30. Watering or other dust approved dust control methods will be required during the construction of plant sites, rights-of-way, tailings ponds, and during rehabilitation operations when dust and resulting air pollution exceeds standards set by the Wyoming DEQ.

31. Temporary or unpaved road surfaces will be water sprayed or covered with a dust binding agent to reduce dust and visual impacts during the heavy vehicular use periods.

32. Soil stockpiles from tailings ponds and plant sites with wind erodibility potential shall be graded on all sides to a maximum slope of 4:1 before being revegetated. These stockpiles will be seeded as soon as possible to provide soil stabilization. Other wind erosion precautions such as snow fences, mulching, mixing of topsoils, or covering stockpiles with soils of low wind erosion properties will be done where deemed necessary.

33. Stockpiles of trona and coal shall be covered.

34. Permanent access roads to plant sites, mine shafts, parking lots, etc., will be paved (asphalt) to eliminate dust generated by vehicular movement and designed to acceptable safety standards.

35. Surface disturbing activity will not be allowed on slopes greater than 25 percent unless an engineering plan is submitted and approved by the AO.

36. A soil conservation plan tailored to each mine site shall be developed and approved by the BLM AO prior to construction. The soil conservation plan will include:

    a. Identify on map of area:
        Surface disturbance during construction;
        Location of topsoil and amount;
        Sources and amount of fill material;
        Soil test sites for monitoring; and
        Potential soil erosion areas.

    b. Soil erosion control methods with potential site locations as identified on map of area.

    c. Revegetation of disturbed area, including:
        Methods, materials, time frames.

37. All disturbed areas no longer utilized will be rehabilitated to the satisfaction and specifications of the AO.

38. Clearing of vegetation within pipeline, powerline, and communication line rights-of-way will be limited to that area absolutely necessary for safe operation of equipment and to permit construction activities.

39. Construction of roads, pipelines, powerlines, and communication lines will be generally prohibited between the general period of November 15 and March 1 or as determined by the AO, depending on weather and soil moisture conditions, to minimize total vegetation destruction and soil disturbance.

40. Revegetation must be done using seed from native species to replace the native vegetation that was there prior to disturbance (especially in critical wildlife areas). Executive Order No. 11987 restricts the use of exotic (non-native) species.

41. Waterbars will be constructed on rehabilitated linear rights-of-way to prevent erosion. General guidelines for installation of waterbreaks are: less than 2% grade, 200-foot interval; 2-4% grade, 100-foot interval; 4-5% grade, 75-foot interval; greater than 5% grade, 50-foot interval. A certain degree of latitude is allowed in the waterbreak interval spacing. Unstable soils may require a closer interval spacing, whereas the interval spacing may be greater on very stable soils or rock outcroppings. A conservative (close) interval spacing is the general recommendation. Waterbreaks are generally constructed on the contour and empty on the downhill side of the cleared area. They are to be constructed to begin in vegetation on the uphill side and feather out into vegetation on the downhill side.

42. Pipelines will be buried to a sufficient depth to allow at least 30 inches of backfill above the top of the pipe and the backfill shall not extend above the original ground surface after the fill has settled. Where the underground facility crosses solid rock or extremely rocky terrain, the facility will be buried to sufficient depth to allow at least 18 inches of backfill over the top of the pipe and the backfill shall not extend above the original ground level after the fill has settled.

43. The lessee shall comply with all applicable federal, state, and local laws or regulations that currently exist or are hereafter enacted or promulgated regarding hazardous materials/substances and oil materials. Hazardous materials/substances and oil materials shall be handled, located, stored, treated, and disposed of in an environmentally safe manner. The lessee shall ensure that contamination of soil, water, or other sensitive resources by hazardous materials/substances and oil materials does not occur.

    The lessee shall review EPA's Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 (as amended) to determine whether materials proposed for construction/mining activities qualify as hazardous substances. The lessee shall also identify extremely hazardous substances (EHSs) within the list of hazardous substances by referring to the List of Extremely Hazardous Substances and Their Threshold Planning Quantities defined in 40 CFR 355, as amended. Identified hazardous substances/EHSs shall be quantified as to amount (given in pounds whether in solid, liquid, or gaseous form) that will be present during construction, mining, or soda ash processing activities. The compiled list of hazardous substances/EHSs used on the project (including projected quantities) must be included in the environmental analysis.

    Any release (e.g., leaks, spills, etc.) of hazardous substances in excess of the reportable quantity as established in 40 CFR 117 shall be reported to the National Response Center in Washington, D.C., as required by he Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended. A copy of the release report shall be given to appropriate federal (including BLM), state, and local agencies.

    Release of hazardous substances or oil materials (including but limited to petroleum,, fuel oil, crude oil, crude condensate, oil refuse, and oil mixed with wastes) shall be reported to the Wyoming Department of Environmental Quality (WDEQ) if the release exceeds WDEQ's standards in Regulations for Releases of Oil and Hazardous Substances into Water of the State of Wyoming, Chapter IV (W.S. 35-11-301 and 35-11-302). Oil materials must be handled, located, stored, treated, and disposed of in accordance with the lessee's Spill Prevention, Control, and Countermeasure Plan as determined by 40 CFR 112.

44. All trash and garbage must be stored in an approved container/cage, and hauled to an authorized sanitary landfill.

45. Clearance for Special Status Plants must be done by an authorized botanist prior to any surface disturbing activities. If SSP species are found during surveys, the AO may require:

    - Reasonable relocation of the surface facility to where the plants are less abundant;
    - above-ground placement to avoid surface disturbance;
    - restrict construction traffic to existing roads;
    - on-site monitoring of construction activities by a qualified botanist to avoid impacts to existing off-site locations;
    - fencing, flagging or other means of identifying avoidance area;
    - transplantation of impacted SSPs; and/or
    - timing of disturbance for after seed set.

46. All areas that would pose hazards to livestock and wildlife species will be fenced. Such areas include plant sites, tailings ponds, containment ponds, primary and secondary sewage lagoons, etc. Fencing standards will be approved by the AO.

47. The most recognized method(s) of hazing, harassing, or distracting the birds will be employed to diminish the possibility of migratory waterfowl use of tailings ponds. Records will be kept on the disposition of all wildlife involved in tailings ponds incidents and submitted to the Fish and Wildlife Service.

48. Tailings ponds will be patrolled, and migratory birds that do use the tailings ponds and are rendered flightless will be rehabilitated and released through the use of halfway houses.

49. Visible structures will be painted with natural colors to blend with the landscape (pump houses on water lines, storage tanks, etc.). Appropriate colors will be selected by the AO.

50. Developments will be designed to meet VRM Class standards.

51. Ancillary facilities such as roads, powerlines, and pipelines should be located adjacent to existing linear facilities wherever possible.

52. Borrow areas or gravel pits on public land will normally require a permit from the BLM.

53. All costs associated with relocating public utility or pipeline facilities to accommodate sodium production will be borne by the lessee.

CHAPTER III

AFFECTED ENVIRONMENT

INTRODUCTION

As specified in statute, regulation, or Executive Order (refer to BLM Manual H-1790-1, Appendix 5), for specific authority), the following critical elements have been reviewed and are not affected by this leasing proposal or by the potential for development due to leasing; thus, areas of critical environmental concern (ACECs), unique farm lands, Native American religious concerns, wild or scenic rivers, and wilderness areas will not be analyzed in this document. The critical elements potentially affected by leasing due to the possibility of development include air quality, cultural, wetland/riparian/floodplain areas, hazardous materials, Special Status Species (animal and plant), and surface and ground water quality. Vegetation, geology, and paleotonlogical resources will also be addressed.

Additionally, public scoping identified the following issues as relevant to this leasing proposal; therefore, they will be addressed in this document: coincidental development of trona and oil and gas; potential impacts to soils and erosion due to possible development; impacts of up to two new mining operations on existing producers; impacts to recreational activities in and around Flaming Gorge NRA and associated rivers, Devil's Playground WSA, and historic trails and sites; impacts of potential development on wildlife and fishery resources; and the social and economic impacts of possible development on local communities.

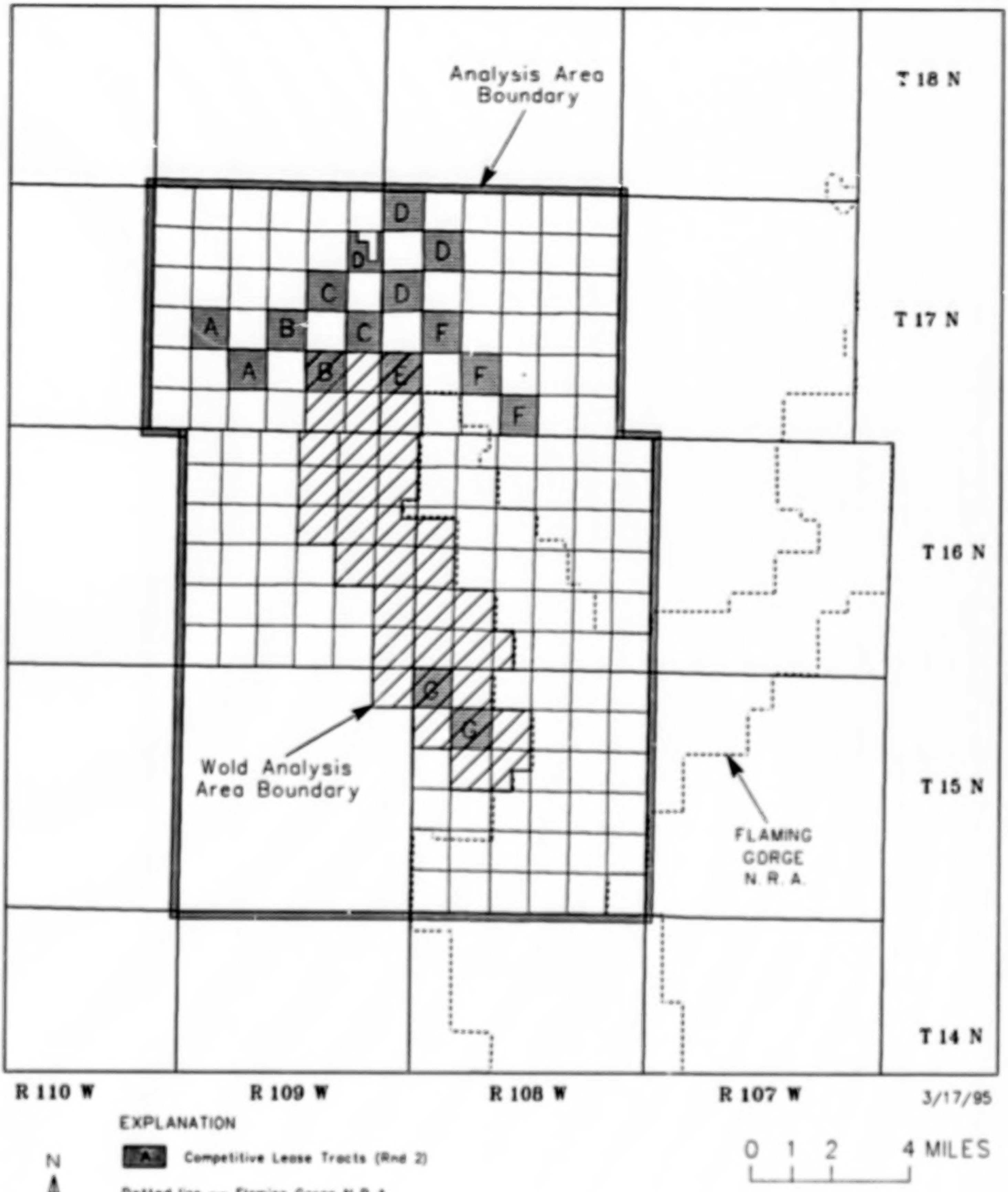
GENERAL ENVIRONMENT

The lease analysis area (refer to Map 2), addressed in this assessment overlaps the Green River and Kemmerer Resource Areas. Land ownership is in a "checkerboard" pattern: generally speaking, every other section is privately owned (usually odd number sections) and the alternating sections are owned by the citizens of the United States and managed by the BLM or other federal agency (i.e., U.S. Forest Service) or by the State of Wyoming (usually sections 16 and 36).

The proposed lease tracts are within the KSLA. Sodium ownership within the KSLA consists of: federal government (57.2%); private (37.9%); and state (4.89%).

The analysis area is a mid-latitude, dry climate type (cold steppe), consisting of little precipitation, low to moderate humidity, cool summers and cold winters. These conditions are typical of mid-latitude, generally high elevation, interior continental locations separated from oceanic water sources. Although most weather systems originate in the Pacific Ocean, extremely cold systems occasionally drop down from Canada.

Annual precipitation averages less than nine inches, coming mostly from spring and summer thunderstorms and winter snowstorms. Winter temperatures can range from below zero to 35 degrees Fahrenheit and summer temperatures usually range from 50 to 85 degrees although higher summer temperatures are common. The frost-free period normally lasts from around June 1 through the first of September (approximately 100 to 114 days). Snowfall can happen anytime of year but usually occurs between September and May, with an average accumulation of nearly 20 inches. Winds predominate nearly 55%



MAP 2
PROPOSED SODIUM COMPETITIVE LEASE TRACTS

of the time from the west and west-southwest, with an average wind speed of 11 miles/hour. Nearly 12% of the time, winds are calm. Wind speeds greater than 20 miles/hour occur nearly 13% of the time. Blizzards are common, and other extreme weather events, such as drought and floods may occur (Science Applications, Inc. 1980).

AIR QUALITY

The analysis area has been designated as either "attainment" or "unclassified" for all pollutants, and is also designated Prevention of Significant Deterioration (PSD) Class II. A description of area classification, pollutant standards, and their significance is provided in Chapter IV (Environmental Impacts), Air Quality Significance Criteria. Although there is no pollutant monitoring in the area at this time, levels are estimated to be low and within standards. Notable exceptions include high, short-term concentrations of particulate matter which are expected to occur near towns due to local combustion sources such as incinerators, residential woodsmoke (inhalable particulate matter known as PM-10), mining and agricultural operations (total suspended particulates or TSP), and unpaved roads (TSP). Significant regional TSP levels are probably due to fugitive dust (primarily wind blown dust). Rural noise levels should average 30 to 50 decibels with occasional peaks levels to 90 decibels.

Table 1 summarizes probable pollutant concentrations as reported in the Wold EA (pages 3-15 through 3-22). Lead and ozone concentrations were not measured but can be assumed to be minimal.

TABLE 1

REPRESENTATIVE AIR POLLUTANT BACKGROUND CONCENTRATIONS

(micrograms per cubic meter)

POLLUTANT	AVERAGING TIME	CONCENTRATION	FEDERAL STANDARD	STATE STANDARD
Carbon monoxide	1-hour	3,500	40,000	40,0000
	8-hour	1,500	10,000	10,000
Nitrogen dioxide	Annual	3	100	100
Particulate Matter[1]	24-hour	45	150	150
	Annual	12	50	50
Sulfur dioxide	3-hour	63	1,300	1,300
	24-hour	32	365	260
	Annual	2	80	60

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[1] The reported particulate matter concentrations are for TSP (all particles less than 50 micrometers in diameter), although the federal standards apply only to PM-10 (particles less than 10 micrometers in size). The State of Wyoming standards apply to both TSP and PM-10.

Visibility impacts may occur (primarily due to fine sulfate, nitrate, and carbon particles) at concentrations well below federal and state air quality standards. The nearest visibility monitoring station operated by BLM was nearly 40 miles north-northeast of the study area and used between 1987 through 1991. Standard visual range values were estimated using contrast measurements taken from photographs. The values ranged from 40 - 60 to 160 - 260 miles with an average of 95 - 150 miles (Air Resource Specialists, Inc. 1990). These values are much better than most of the country, only the Great Basin and the Colorado Plateau regions consistently have better visibility.

CULTURAL RESOURCES

Most of the cultural inventory done within the lease analysis area has been associated with the Wold Trona development and previous pipelines that traverse the area (Reiss 1982; Hofer 1988; Kautzmand, et al. 1994). Since only 5% of the area has been studied, insufficient data exists to provide reliable insights into the cultural patterns within the study area.

At present approximately 250 cultural sites, exclusive of trails, roads, or archaeological landscapes, occur within the study area. These sites include a range of known temporal associations (e.g., campsites, graves, bone beds, and quarries) common to southwestern Wyoming. About 88% of the resources found are lithic scatters or unprepared hearths in the form of soil stains and/or piles of fire-altered stone; a few (4.3%) of these sites are associated with slab-lined hearths or petroglyphs. About 3.2% are quarry sites. Thus, roughly 91% of the recorded sites date to prehistoric and/or protohistoric times.

Approximately 9% of the recorded sites date to the historic period. Some feel that recordation practices of the 1970s and 1980s ignored historical sites for the most part and believe the incidence of historic artifacts to be seriously under-represented.

Of these sites currently recorded, 82% are considered to be not eligible for inclusion within the National Register of Historic Places. Excluding trails, 6.5% have been recommended as eligible with the remaining 10.7% lacking resolution of eligibility.

Prehistoric Resources

Recorded prehistoric sites include one PaleoIndian component, 12 Archaic components, and four Late Prehistoric components. This indicates a wide time-span of occupation throughout the area.

A brief examination of prehistoric site types and locations indicate that the pattern found here is much like that found along the Missouri Trench. The areas adjacent to the rivers have the highest density of sites. These sites tend to be larger and have evidence of long-term and repeated use. A few "bone beds" were recorded along the margins of the Green River prior to completion of Flaming Gorge Dam. Most likely, these were bison or antelope kill areas. Upland areas show a more dispersed, seasonal settlement pattern.

It should be noted that a portion of the study area is encompassed by the Blacks Fork Archaeological Landscape. This area contains a diffused scatter of lithic debris covering a very large area. Most likely, this represents a moderate to high level of use over a long period of time that has resulted in highly dispersed scatter of unassociated artifacts and debris.

Historic Resources

A records check indicated that there may be at least two human graves in the study area but no information is available concerning the nature of these graves. Any remains of Native Americans are subject to the terms of the Native American Graves Protection and Repatriation Act.

Sometimes local place names provide clues regarding the potential for cultural/historic resources. The analysis area contains places named "Buckboard Crossing" and "Massacre Hill" which may be indicative of the potential for historical artifacts.

The lease analysis area has been used for livestock grazing for well over a century. The first cattle operations in the general area were those of several American fur trappers who had married Native American women and operated ranches along Henry's Fork several miles to the south. One of these individuals, Jack Robertson, is known to have come to the area in 1832 with Kit Carson from Taos. Robertson apparently served as a trading intermediary between Shoshone Indians in the Green River Basin and traders in the southwest such as Carson and William Bent.

Beginning in the 1840s, Robertson, his son-in-law Robert Hereford, Shadrack Large, Dick Son (son-in-law of famed trapper Jim Baker), Robert Dempsey, Elijah Driscoll and others were engaged in trading livestock with westward bound emigrants. They traded one good animal for three worn out animals brought by the pioneers. By repeating that cycle for several years they were able to establish large herds of cattle. Some of these animals were then sold to the military at Fort Bridger. In the 1850s, Hereford and Dempsey drove cattle from the Henry's Fork valley to the gold fields around Virginia City, Montana. Descendants of several of these early settlers still live in the Green River Basin and others, being part Shoshone, are residents of the Wind River Reservation.

In the later 1870s and early 1880s, establishment of the Union Pacific Railroad created a route to ship livestock to distant markets thus adding a note of permanence to livestock raising as an economic entity in southwestern Wyoming. Also, in the later part of the 19th century, sheep raising became part of the operation of many ranches in this part of Wyoming. Often sheep and cattle were raised by the same livestock operator, and at least in this immediate area, there was not the animosity between cattlemen and sheepherders that was common elsewhere in the West.

A review of the Tabulation of Adjudicated Water Rights indicates that no water rights have been filed on the Blacks Fork or the Green River within the lease area. This indicates that the region was utilized for open range grazing and not for irrigation of hay crops. The area today remains important for winter grazing of livestock, especially sheep, although the size of herds using the region is not nearly so large as it was in the past.

The only evidence of these open range grazing operations known in the project area is several stock herder camps. These sites consist of scatters of artifacts, including glass bottles, tin cans, and horseshoes. The sites are generally located on prominent ridges that afforded the herder a good view of the surrounding terrain to keep watch over the flocks. Most of these sites are not significant; however, on rare occasions artifacts may indicate that a particular site has several periods of occupation reaching back into the 1880s. These sites could be significant because of the information they contain concerning the historical variability in stock raising in this region over time.

Historic Trails

The analysis area contains over 42 miles of known historic trail and/or road segments (see Map 3). Both the Cherokee and Bryan to Brown's Park Road traverse the study area. Bryan to Brown's Park Road is important on a local and regional basis while the Cherokee Trail appears to be nationally important. Segments of these trails overlap in several places. Some work has been performed on the trail/road system within the study area (Gardner 1990; Gardner, et al. 1994).

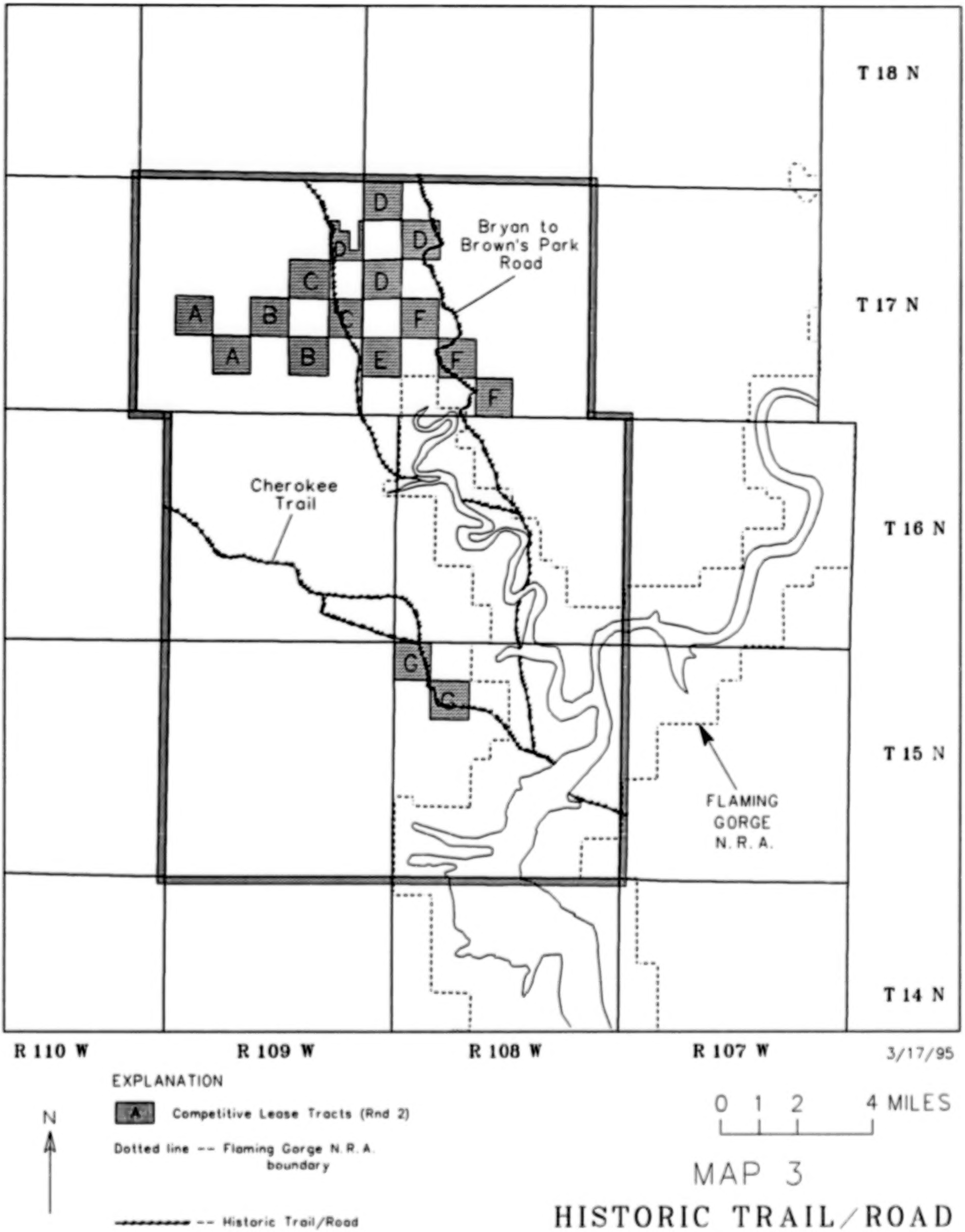
The Cherokee Trail was named for the migration of companies of Cherokee Indians in 1849-1850. Basically, this trail provided a variant of the California Trail used by the Cherokees to avoid the deadly effects of cholera plaguing white emigrants during the migration to California's gold fields. The route followed by the Cherokees was largely used for the Overland Trail in the 1860s. Most of the people using the Cherokee Trail were en route to a destination outside the area.

Established in the late 1860s, the Bryan to Brown's Park Road represents the development of a transportation system linking the local communities of the region. While the Cherokee Trail served as an interstate or interregional transportation corridor, the Bryan to Brown's Park Road served to move people and goods within the region. However, the Union Pacific Railroad went through Bryan and eventually the town became a transportation hub for the area providing a means for local ranching/farming concerns to interact with the national economy. It is not clear how much of the historic trail/road present within the analysis area retains sufficient integrity to be considered an intact segment of the trail/road system.

GEOLOGY AND PALEOTONLOGICAL RESOURCES

A general summary of the topography, geology, mineral resources, and paleontological resources is found on pages 36 through 41 in the Sodium EA. A more site-specific description, including geological hazards is contained on pages 3-1 through 3-10 in the Wold EA. See the Surface Geology Map (Map 4) and the schematic drawing (Figure 2) depicting stratigraphic relationships between major Tertiary rock units within the Green River Basin.

The analysis area is within the Green River Basin, a large Tertiary-age topographic depression located immediately to the east of the Overthrust Belt. Elevations range from about 6,000 to 6,500 feet. The surficial formations in the analysis area are sedimentary and nearly flat-lying: the Laney Member of the Green River Formation, and the Bridger Formation, which conformably overlies the Green River Formation. Both are Eocene in age. The Bridger Formation consists of "greenish-gray, olive-drab, and white tuffaceous sandstone and claystone; lenticular marlstone and conglomerate." The Laney Member of the Green River Formation consists primarily of oil shale and marlstone (Love and Christiansen 1985). The Laney Member also contains tuffaceous siltstone and sandstone. The Sand Butte Bed of the Laney Member caps the hills above the city of Green River, and resulted from an influx of volcanic ash from the Absaroka volcanic area in northwestern Wyoming. The ash beds, which have been reworked, were deposited on an erosion surface of the Rock Springs uplift (Roehler 1993).



MAP 3

HISTORIC TRAIL/ROAD SITES

The surface of the eastern half of the study area consists almost entirely of the Laney Member of the Green River Formation. In the western half of the study area, the Bridger Formation - characterized by badland topography - overlies the Green River Formation over most of T. 15 N., R. 109 W., and in portions of T. 16-17 N., R. 109 W. Quaternary-age dune sand covers portions of the Bridger and Green River Formations in T. 16-17 N., R. 109 W. (Love and Christiansen 1985).

In the subsurface, the Wilkins Peak Member of the Green River Formation directly underlies the Laney Member. The Wilkins Peak contains approximately 33 beds of trona, or trona and halite, some of which are currently being mined by five companies in the area. At a location near the northern boundary of T. 15 N., R. 109 W., the Wilkins Peak is approximately 1,150 feet thick, with the trona contained in the lowermost 800 feet. Below the Wilkins Peak is the Tipton Shale Member of the Green River Formation, which in turn is underlain by the Wasatch Formation of Eocene age (Roehler 1992).

Besides trona, the analysis area is known to contain oil shale in the Green River Formation, coal in various formations below the Green River, and sand and gravel deposits along streams. Hydrocarbons are produced from fields found approximately 12 miles west of the western boundary of the analysis area.

Earthquake potential is considered low within the analysis area as indicated by the historical data described in the Wold EA (pages 3-6 and 3-7). A mine collapse in February 1995, located just north and west of the analysis area, was initially thought to have been caused by an earthquake. However, further study raised questions regarding the role of earthquakes in the collapse. While an earthquake or another cause may have triggered the event, seismic studies indicate that most of the energy released from the five-plus magnitude event came from the collapse itself.

Landslide potential is low although occasional slumping along streambanks may occur. The natural subsidence potential is low.

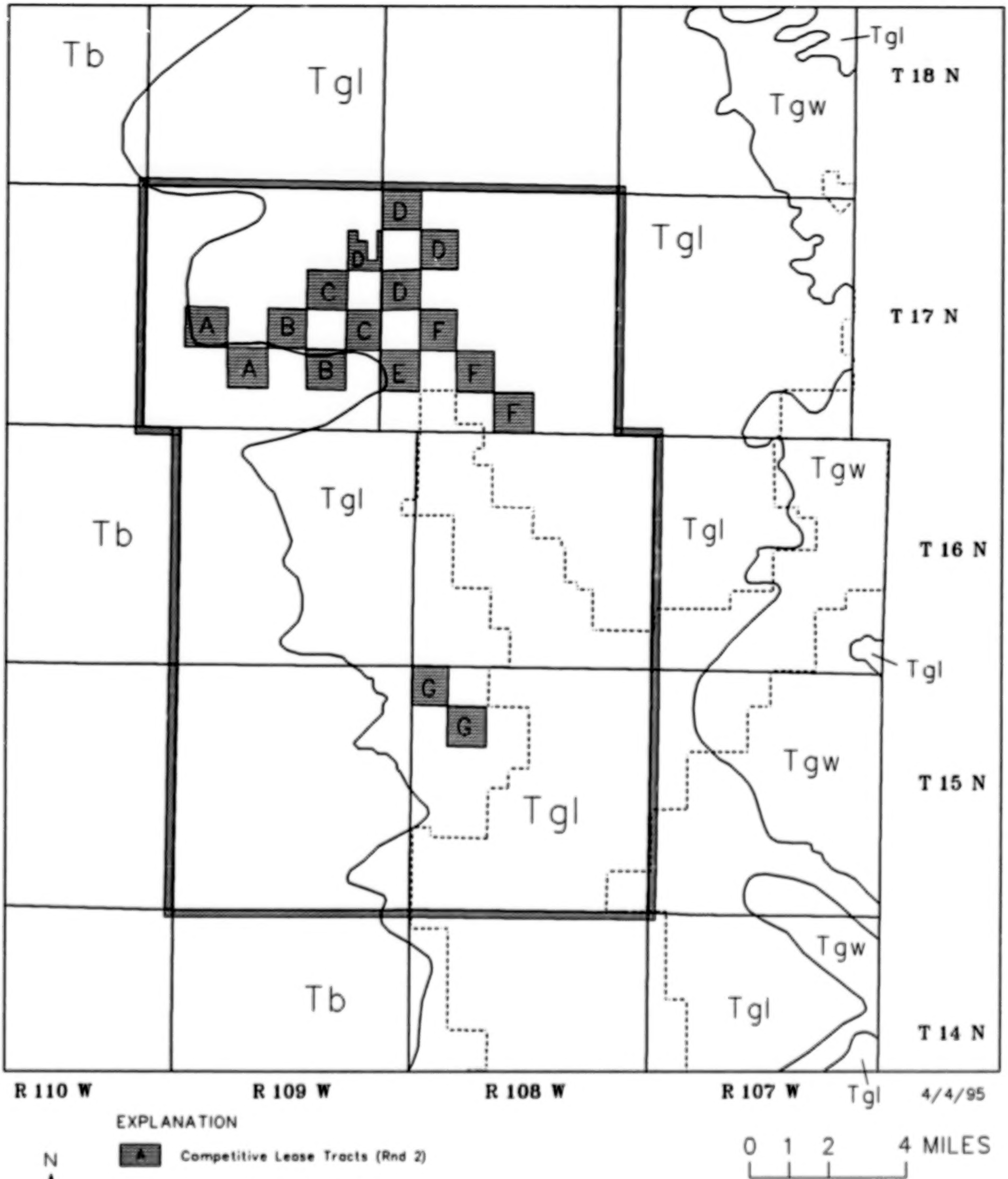
Windblown sand is concentrated in portions of T. 16, 17 N., R. 109 W. (Love and Christiansen 1985).

Both the Laney Member of the Green River Formation and the Bridger Formation are well known for their rich collections of vertebrate and invertebrate fossils. The Bridger Formation has produced mammals, reptiles, amphibians, fish, mollusks, plants, and ostracods. The Laney Member is known for numerous species of fish (more than 35 species), plants, insects, reptiles, and amphibians (Geo/Resource Consultants 1984). These formations are exposed over most of the study area.

SOILS/EROSION

Soils information for this document was derived from an Order 3 survey and published as the "Soils Inventory of the Green River Area, Wyoming" (1981). Some proposed leasing tracts in the northwest portion of the lease area have not been inventoried; therefore, inference must be made about the soil types in that particular area. Map 5 reflects soils information for the lease analysis area and was derived from the General Soils Map of Sweetwater County, not from the Order 3 survey.

Soils within the lease analysis area are generally light colored, calcareous throughout, and have a weakly developed structure and horizonation. These soils are weathered from sandstones, siltstones, and mudstones of the Laney member of the Green River Formation.



EXPLANATION

▨ A Competitive Lease Tracts (Rnd 2)

Dotted line -- Flaming Gorge N.R.A. boundary

N

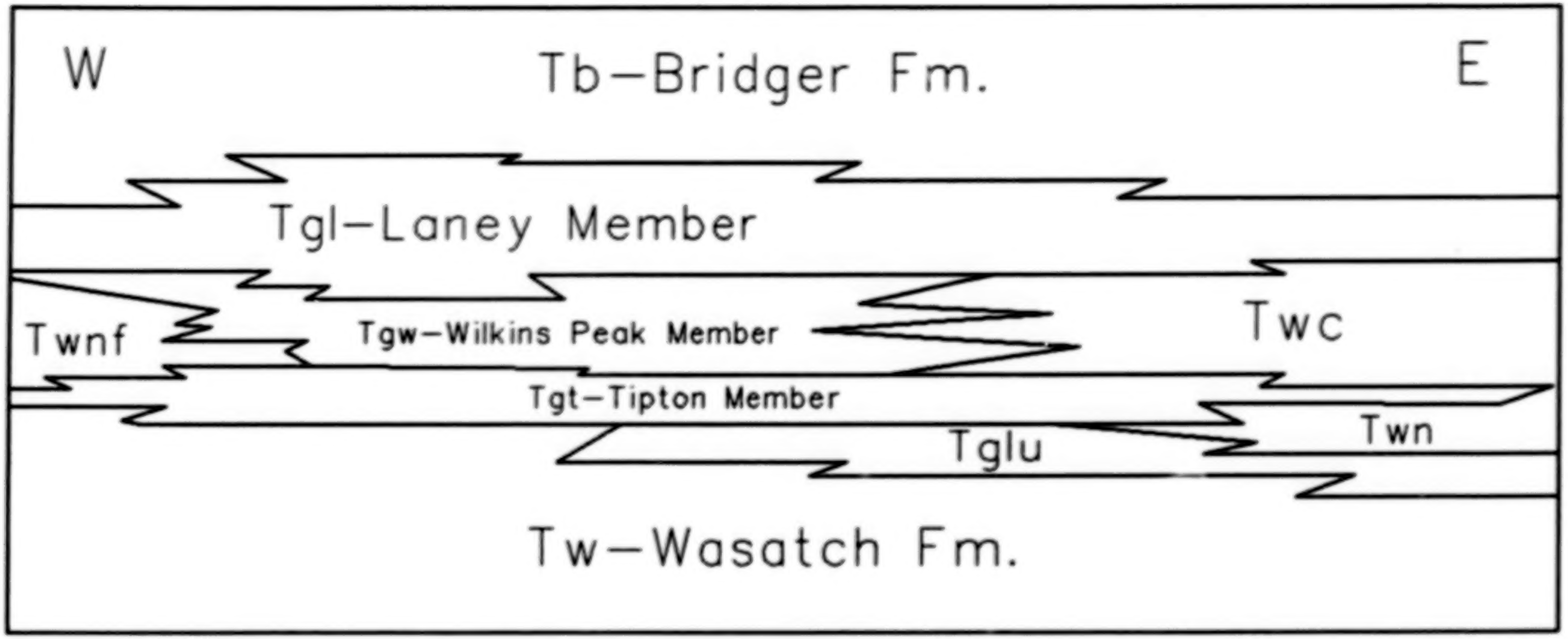
Tb -- Tertiary Bridger Formation

Green River Fm. ┌ Tgl -- Tertiary Laney Member
└ Tgw -- Tertiary Wilkins Peak Member

0 1 2 4 MILES

MAP 4
SURFACE GEOLOGY

Figure 2



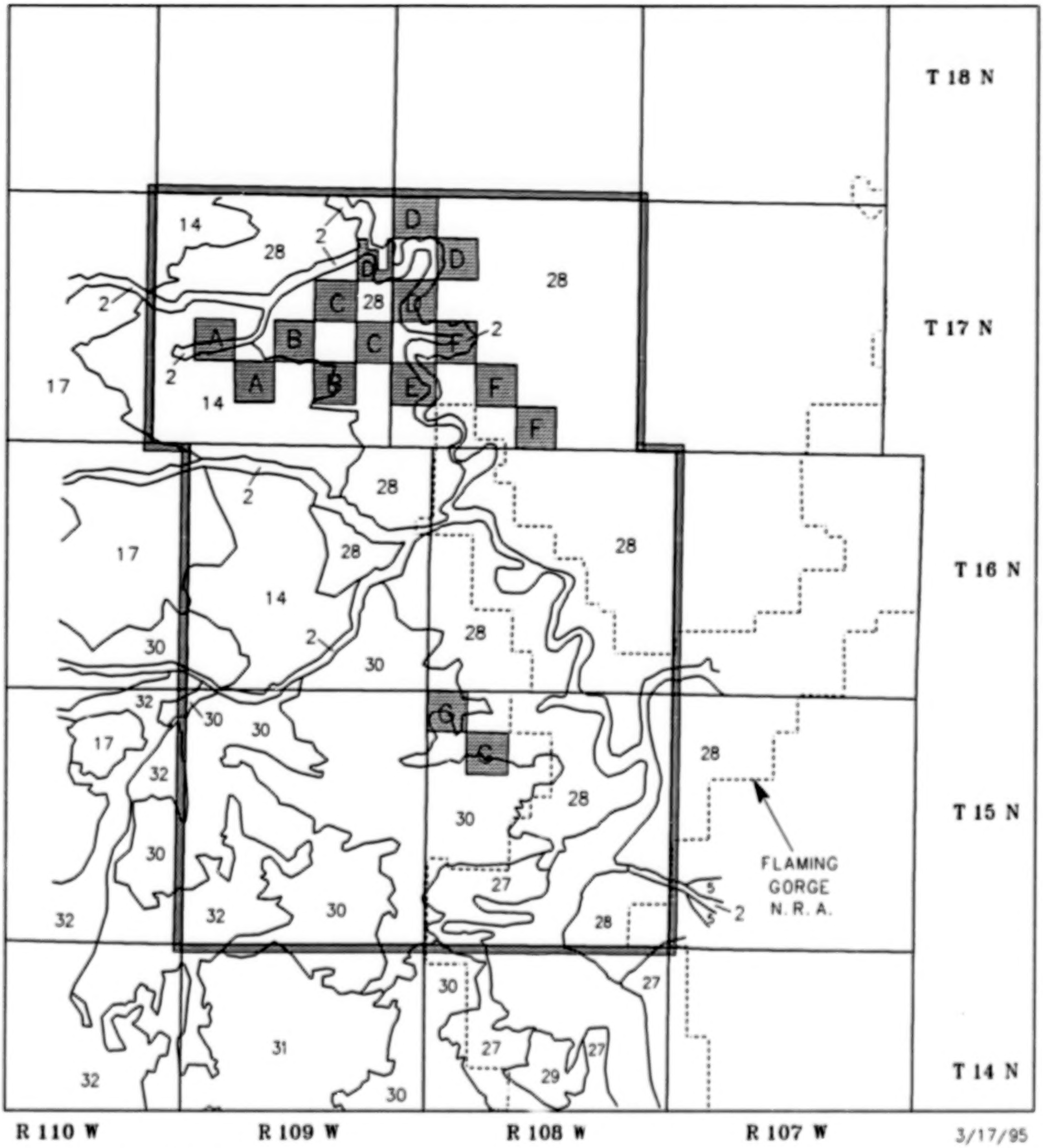
Schematic section depicting stratigraphic relationships between the major Tertiary rock units of the Green River Basin, Wyoming.

EXPLANATION

Tb – Bridger Formation

Tgl – Laney Member
Tgw – Wilkins Peak Member
Tgt – Tipton Member
Tglu – Luman Tongue
Green River Fm.

Twc – Cathedral Bluffs Tongue
Twnf – New Fork Tongue
Twn – Nilan Tongue
Tw – Main Body Wasatch Fm.
Wasatch Fm.



EXPLANATION

▨ A Competitive Lease Tracts (Rnd 2)

Dotted line -- Flaming Gorge N. R. A. boundary

(Refer to description of soil types on following page)

MAP 5
GENERAL SOIL TYPES

GENERAL SOILS IN THE ENVIRONMENTAL ANALYSIS AREA

2	Made up of varying amounts of Dines, Dines Overflow, Grieves, Ret, Kandaly, Monte, and Dinco soils.
14	Made up of varying amounts of Huguston, rock, Kandaly, Teagulf, and Pepal soils.
17	Made up of varying amounts of Monte, Youjay, Westvaco, and Kandaly soils.
27	Made up of varying amounts of Firehole, McCullen, Buckboard, rock and Jansley soils.
28	Made up of Huguston, Teagulf, Pepal, Winton, Tasselman, Thayer, Cambarge, McCullen, and Zirkel soils.
29	Made up of Horsely, Haterton, and Monte soils.
30	Made up of varying amounts of Horsely, Huguston, Youjay, and Pepal soils.
31	Made up of varying amounts of Rallod, rock, and badlands.
32	Made up of varying amounts of Garita, Youjay, and Westvaco.

The proposed leasing tracts A through F (T. 17 N., Rs. 108 and 109 W.), are dominated by well-drained shallow (less than 20" to bedrock) soils that are found on upland areas with slopes of 4 to 30%. These soils generally have a fine sandy loam texture (Unified Rating=SM) and often have coarse fragments in the substratum (Unified Rating=GM, GP-GM). These soils have a permeability rate of 2.0 - 6.0 inches/hour and may have a pH of up to 9.0 in the lower soil depths. Wind and water erosion potential is considered moderate. Range sites are generally very shallow and shallow sandy.

Alluvial fans and sideslopes are dominated by well drained, deep (greater than 40 inches to bedrock) fine sandy loams and loams (Unified Rating=ML) with slopes of one to 10%. These soils have a permeability of 0.6 - 6.0 inches/hour and may have a pH of 9.0 in the lower soil depths. Some areas may also have electrical conductivity levels of 2 - 4 mmhos/cm. Headcutting and the resulting steep banks are common through this area. Erosion potential is moderate for both wind and water. Range sites are considered to be loamy and sandy.

The proposed leasing tract G (T. 15 N., R. 108 W.), is dominated by well drained, shallow and moderately deep (20 to 40 inches to bedrock) fine sandy loams and sandy loams (Unified Rating=SM) with slopes of 3 to 30%. Some soils in this area may have concentrations of calcium carbonate below the surface. These soils have a permeability rate of 2.0 - 6.0 inches/hour and may have a pH of 9.0 in the lower soil depths. Erosion potential is moderate for both wind and water. Range sites are considered to be shallow sandy and sandy.

VEGETATION

A complete discussion of vegetation types in the proposed leasing area is described in pages 3-31 through 3-34 of the Wold EA and is summarized here.

Vegetation found within the proposed leasing area is dominated by upland, drought tolerant species. Six general vegetation communities occur within the area: upland big sagebrush, mixed desert shrub, gardner saltbush flats, greasewood lowlands, mixed shrub-stabilized sand hummocks, and rough breaks. These communities phase in from one type to another but often intermingle. Barren local areas commonly known as rough breaks intermingle within the different vegetation communities.

The upland big sagebrush community is dominated by big sagebrush (*Artemisia tridentata*) with common understory components consisting of spiny hopsage (*Graya spinosa*), shadscale saltbush (*Atriplex confertifolia*), douglas rabbitbrush (*Chrysothamnus viscidiflorus*), and rubber rabbitbrush (*Chrysothamnus nauseosus*). Thickspike wheatgrass (*Agroypron dasystachyum*) is the dominant grass species.

The mixed desert shrub community is dominated by big sagebrush or codominant species with spiny hopsage, douglas rabbitbrush, gardner saltbush (*Atriplex gardneri*), black greasewood (*Sarcobatus verminculatus*), shadscale saltbush, fourwing saltbush (*Atriplex canescens*), and horsebrush (*Tetradymiaspp.*). Understory grass species include thickspike wheatgrass, Indian ricegrass, bottlebrush squirreltail (*Sitanion hystrix*), and several species of bluegrass.

The gardner saltbush flats community occurs in low lying areas in association with black greasewood. This community is dominated by low growing plant species consisting of gardner saltbush, bud sagewort (*Artemisia spinescens*), Indian ricegrass, bottlebrush squirreltail, common winterfat (*Ceretoides lanata*), greenmolly summercypress (*Kochia americana*), and gray horsebrush (*Tetradymia canescens*).

The greasewood lowland community generally occurs in conjunction with the gardner saltbush flats and mixed desert shrub communities. Foxtail barley (*Hordeum jubatum*) is generally the associated understory species to this nearly monotypic community of black greasewood.

Mixed shrub-stabilized sand hummocks occur within sandy locations. Sand hummocks are stabilized with spiny hopsage, rubber rabbitbrush, douglas rabbitbrush, big sagebrush, and black greasewood. Within the mixed shrub areas, spiny hopsage is usually the dominant overstory shrub species. Indian ricegrass is the dominant grass species.

The rough breaks vegetation occurs along barren areas, steep slopes, cliffs, rocky ridges, side slopes, and rolling hills. This is the most diverse of the vegetation types. It has the lowest average percentage of cover and annual herbaceous production, and the lowest in species composition as well as extremes in productivity potential.

Five federal Category 2 plant species known to occur in habitats similar to those in the lease analysis area were identified as having moderate potential of occurring there. Current vegetation inventories conducted by botanists from the Rocky Mountain Herbarium and Wyoming Natural Diversity Database are expected to provide additional information regarding the location of special status plant species in the vicinity of the analysis area. Plant species of concern would be further analyzed in subsequent environmental analysis.

More detailed analysis of the above-mentioned special status plant species can be found under the section entitled **Special Status Species**.

A discussion of riparian/wetland vegetation can be found under the section entitled Riparian/Wetland/Floodplains.

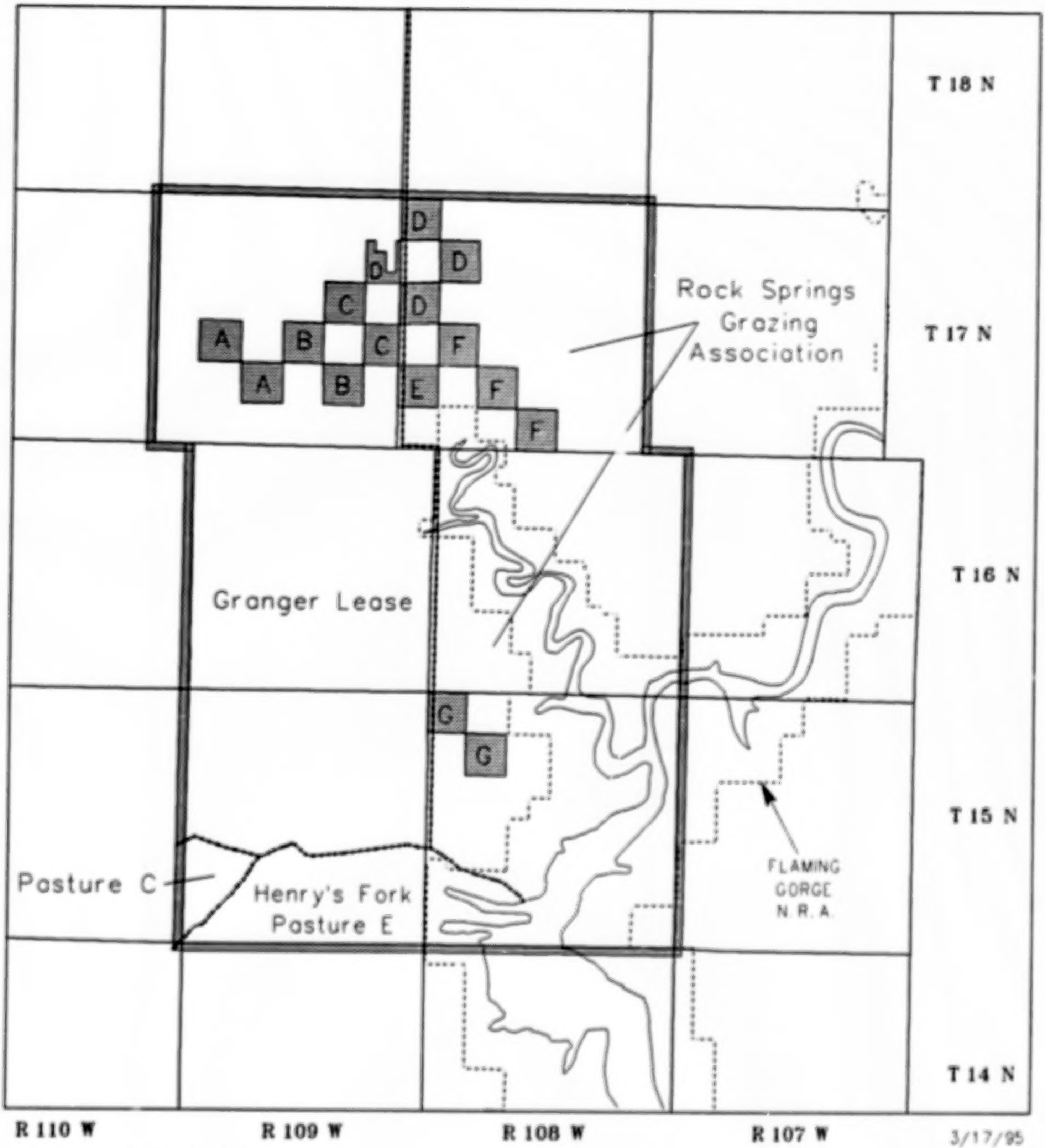
RANGE RESOURCES

The analysis area contains grazing allotments from two resource areas - the Green River Resource Area and the Kemmerer Resource Area. The allotments in the Green River Resource Area contain portions of the Rock Springs Allotment and the Henry's Fork Allotment. A portion of Kemmerer Resource Area's Granger Lease Allotment is within the analysis area. Map 6 shows allotment/fence boundaries.

The lease analysis area contains approximately 6,469 AUMs (3,471 AUMs in the Rock Springs Grazing Allotment, 744 AUMs in the Henry's Fork Allotment, 533 AUMs in the Granger Lease Allotment, 1,617 AUMs in the NRA, and 104 AUMs on state-controlled land).

The Rock Springs Allotment is used year-round and has both sheep and cattle use within the analysis area. Sheep use occurs in the winter and cattle use occurs during the summer months. Livestock use in the Henry's Fork Allotment consists mainly of summer cattle use in pasture C and year-round sheep and cattle use in pasture E. Livestock use in the Granger Lease Allotment consists of summer cattle use and winter sheep use. Livestock use occurs on the NRA in both the Rock Springs and pasture E of the Henry's Fork Allotment.

Range improvements within the Rock Springs and Granger Lease Allotments include the boundary fence. Both boundary and pasture fencing is present in the Henry's Fork Allotment in addition to several water



EXPLANATION

▨ A Competitive Lease Tracts (Rnd 2)

Dotted line -- Flaming Gorge N. R. A. boundary

-------- -- Fence Line/Allotment/Pasture Boundary

N

0 1 2 4 MILES

MAP 6
GRAZING ALLOTMENTS

Range improvements within the Rock Springs and Granger Lease Allotments include the boundary fence. Both boundary and pasture fencing is present in the Henry's Fork Allotment in addition to several water reservoirs used by livestock and wildlife. Nearly all water sources are located in pasture E. Numerous two-track roads run throughout the analysis area.

SURFACE/GROUND WATER

Specific information on the hydrology of the affected environment can be found on pages 3-22 through 3-30 of the Wold EA, and on pages 43 through 46 and A41 through A45 of the Sodium EA.

The surface of the proposed lease tracts A - F drain into the Flaming Gorge Reservoir via the Blacks Fork River. The proposed lease tract G is drained by Halfway Hollow. Except for the Blacks Fork River, all the drainages in the proposed lease area are ephemeral or intermittent with little or no associated riparian areas. The Blacks Fork has perennial flow and associated riparian areas. Refer to Map 7 for representation of the drainage systems surrounding the lease analysis area.

Based upon data provided in the Sodium EA (see page 46), the Blacks Fork River has an average discharge of 373 cubic/feet/second (CFS) and an average erosion rate of 1.48 tons/acre/year. The Blacks Fork contributes about 14% of the water to Flaming Gorge Reservoir and approximately 20% of the dissolved solids load. This information suggests a moderately erosive environment.

Water flows in Halfway Hollow and the tributaries to the Blacks Fork River within the proposed lease area are generally the result of spring snow melt and summer thunderstorms. Contributions from scattered springs and groundwater base flows are relatively minor and have not been quantified at this time.

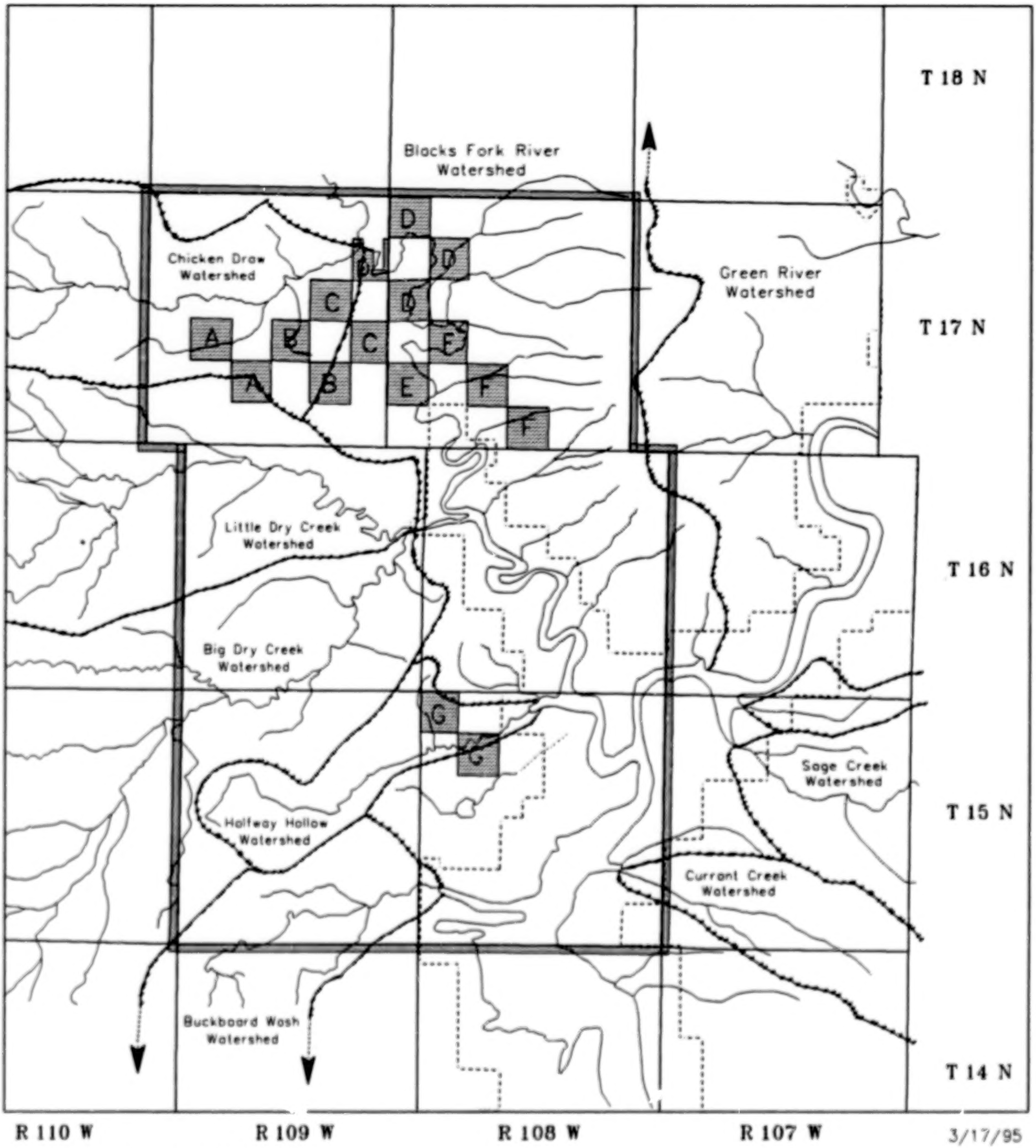
Soils in the area are high in naturally occurring phosphorus and salts and tend to be lightly vegetated and susceptible to erosion. Erosion of these soils during runoff events incorporates these elements into surface waters. As a result, surface water quality shows relatively high levels of dissolved solids, alkalinity, hardness, sodium bicarbonate, sulfate, and chloride. Thus, water quality is not considered high and use is generally limited to livestock, wildlife, and some industrial applications.

Runoff flows tend to be short and intense in nature. Sediment stored within channel beds tend to move easily during runoff events.

Ground Water

A complete discussion of ground water characteristics and quality can be found in pages 3-24 through 3-30, Wold EA. A general discussion of ground water resources within the Green River Basin can be found on pages 43 and 44 of the Sodium EA.

To summarize the information in the Wold EA, the proposed lease area is within the Green River structural basin where ground water is contained within unconfined and confined aquifers. Some members of the Green River Formation that may be encountered include the Laney, Wilkins Peak, and Tipton Shale. Low-yield, discontinuous aquifers consisting of fine sands with associated clays and calcareous cements occur in the Laney Shale and Upper Wilkins Peak members. Sands developed within the Tipton Shale member are capable of long-term yields of perhaps 40-50 gallons/minute (Wold EA 1994). Scattered, unconfined aquifers likely occur in the alluvial deposits of larger drainages.



MAP 7

WATERSHED AND DRAINAGE

Unless interrupted by a fault or confining layer, ground water flows tend to mimic the surface topography. Attributes of the individual water-bearing aquifers cover a wide range of physical and chemical characteristics. High levels of water-soluble minerals occur in the soils and parent geology of the area. When ground water moves through this material, it dissolves these minerals. As time in contact with these minerals increases, water quality tends to decrease.

Groundwater quality data is limited but would most likely range from potable to near-potable along river alluvium to low-quality, over-mineralized (trona or black) water. Water yields would also vary widely.

No data is available on the effects Flaming Gorge Reservoir has upon groundwater within the proposed lease area.

WETLAND/RIPARIAN/FLOODPLAINS

The Blacks Fork River is the main water course flowing through the proposed lease area and as such is the main riparian zone. On National Wetland Inventory Maps, it is shown to be comprised of several wetland system types known as Palustrine Emergent with temporary flooding (PEMA), Palustrine Emergent with seasonal flooding (PEMC), and Palustrine Scrub-Shrub with temporary flooding (PSSA) (FWS 1979). Vegetation in this riparian zone is in part comprised of willow, tamarisk, silver buffaloberry, various sedges, rushes, and grass species. The riparian acreage is estimated to be around 200 acres under federal surface management along the Blacks Fork River. The slow moving, open water and associated riparian and upland vegetation on flat topography make this area suitable for a variety of wildlife including migratory waterfowl, shore birds, and other riparian dependent species.

WILDLIFE/FISHERIES

A variety of wildlife may inhabit the analysis area. A wildlife survey completed for the Wold Trona Company's trona project (see Wold EA, pages 3-35 through 3-50 and Appendix D) documented a total of 186 species within and outside the Wold analysis area. Most of these species are common and have wide distribution within the region.

The wildlife discussion will also serve as the biological assessment of the potential impacts to threatened, endangered, and candidate species as listed by the FWS. Appendix C provides a copy of the FWS list of threatened/endangered/candidate species potentially affected by this proposal.

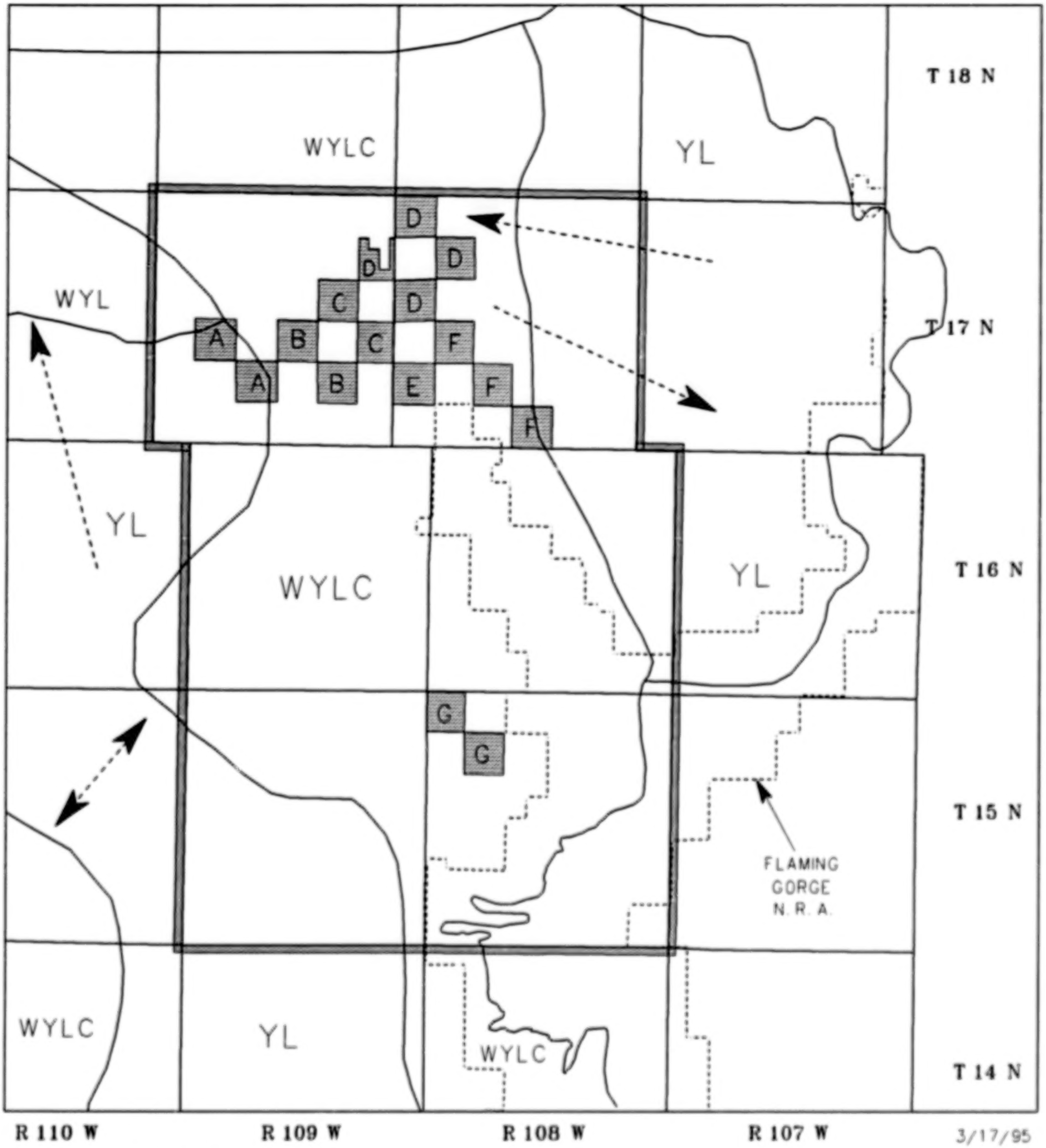
Antelope

The majority of the project area lies within crucial winter range for pronghorn antelope. Provisional summer habitat and transitional migration range during the spring and fall also occur throughout the analysis area. Refer to Map 8 for antelope ranges.

Mule Deer

The analysis area provides year long habitat for the resident deer along the Blacks Fork and the Green River drainages. These drainages also provide seasonal habitat throughout the winter for migratory deer. See Map 9 for mule deer ranges.

35



EXPLANATION

A -- Competitive Lease Tracts (Rnd 2)

Dotted line -- Flaming Gorge N. R. A. boundary

← - - - - - - Migration Routes

YL -- Yearlong Range

WYL -- Winter/Yearlong Range

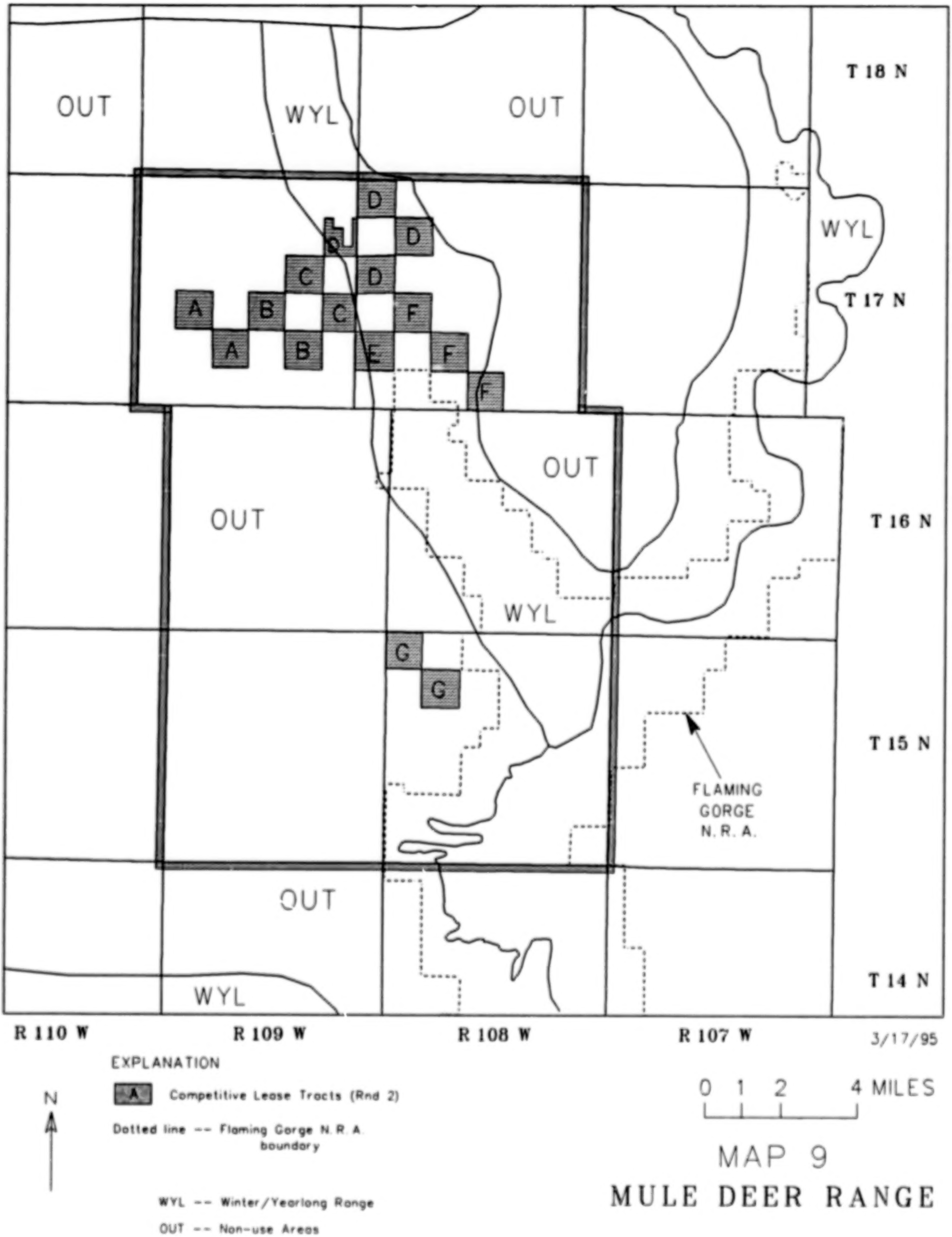
WYLC -- Winter/Yearlong Crucial Range

N

0 1 2 4 MILES

MAP 8

ANTELOPE RANGE



MAP 9
MULE DEER RANGE

Sage Grouse

Leks have recently been documented by the BLM in conjunction with the WGFD in areas adjacent to the analysis area. Map 10 provides known locations of sage grouse leks.

Raptors

There are several raptor nests from multiple raptor species including golden eagles, great-horned owls, red-tail hawks, rough-legged hawks, and kestrels. In addition, ferruginous hawks are known to occur throughout the lease analysis area. Map 10 provides location of known nesting sites.

Migratory Birds

The analysis area is in a major flyway for migratory birds. Neotropical songbirds, migratory as well as residential species are abundant throughout the area. Waterfowl migrates through the area in March and April to reach their summer breeding grounds to the north and again in October and November to reach their wintering ground.

Other Nongame Wildlife

Other known wildlife residing in the area include ground squirrels and other small rodents such as kangaroo rats, deer mice, pocket mice, and wood rats. Predatory species include coyotes, badgers, weasels, and foxes.

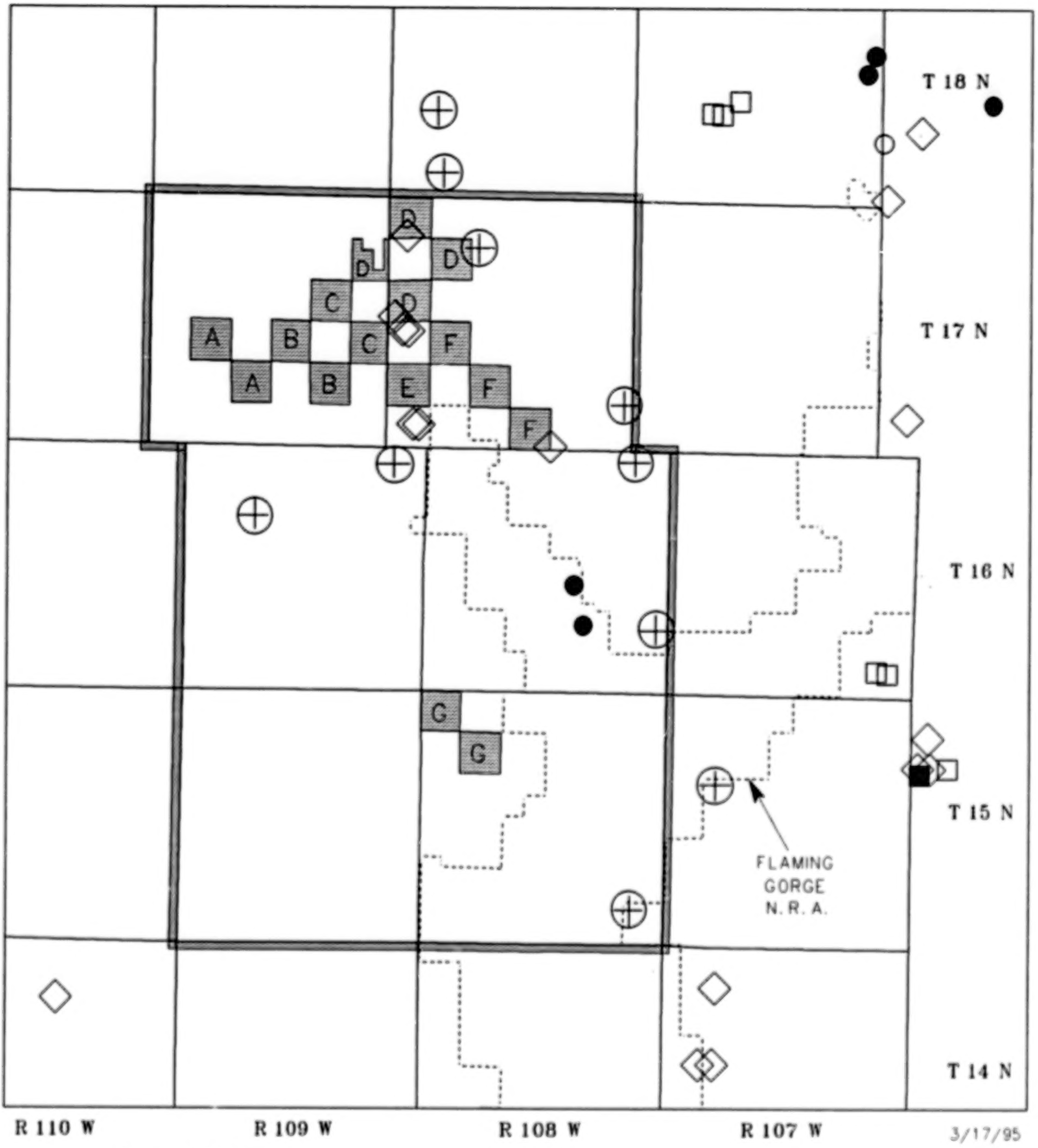
Fisheries

The section of the Blacks Fork River affected by this proposal is inhabited by fish species including channel catfish, carp, white sucker, mountain sucker, fathead minnow, Utah chub, speckled dace, bonneville redside shiner, mottled sculpin, and sensitive species including flannelmouth sucker, bluehead sucker, and roundtail chub. As a tributary to Flaming Gorge Reservoir, the health of the riparian zone on the Blacks Fork river is not only important for its associated wildlife species but also in relation to reducing sedimentation. Stabilization of the banks and encouraging deposition are major hydrologic functions of healthy riparian communities. Being a major recreational area, it is important to keep the riparian zone in functional condition to limit sedimentation to the reservoir.

SPECIAL STATUS SPECIES

The FWS has determined that five species (black-footed ferret, bald eagle, peregrine falcon, whooping crane, and Ute ladies' tresses) listed as either threatened or endangered under the Endangered Species Act of 1973 have the potential to occur within the analysis area. Desirable habitat occurs within or next to the analysis area for the following species:

38



EXPLANATION

▨ A -- Competitive Lease Tracts (Rnd 2)

Dotted line -- Flaming Gorge N. R. A. boundary

⊕ -- Sage Grouse
● -- Prairie Falcon
◇ -- Golden Eagle
□ -- Red-Tail Hawk
○ -- Great-Horned Owl
■ -- Kestrel Falcon

N

0 1 2 4 MILES

MAP 10

RAPTOR NEST SITES AND SAGE GROUSE LEKS

SPECIES	**SCIENTIFIC NAME**	**STATUS**
Black-Footed Ferret	Mustela nigripes	Endangered
Bald Eagle	Haliaeetus leucocephalus	Endangered
Peregrine Falcon	Falco peregrinus	Endangered
Whooping Crane	Grus americana	Endangered
Ute Ladies' Tresses	Spirantes diluvialis	Threatened

Ten candidate wildlife species of both mammals and birds have potential to occur within or adjacent to the analysis area:

Mammals

Preble's Shrew	Sorex preblei	C2
Pygmy Rabbit	Brachylagus idahoensis	C2
Spotted Bat	Euderma maculatum	C2

Birds

Ferruginous Hawk	Buteo regalis	C2
Northern Goshawk	Accipeter gentilis	C2
Mountain Plover	Charadris montanus	C1
Loggerhead Shrike	Lanius ludoviianus	C2
White Faced Ibis	Plegadis chihi	C2
Black Tern	Chlidonias niger	C2
Long Billed Curlew	Numenius americanus	C3

Black-Footed Ferret - The last known wild population was found near Meeteetse, Wyoming. A population was reintroduced into the Shirley Basin in 1992. Black-footed ferrets are directly dependent upon prairie dogs for both food and shelter. Any area capable of supporting prairie dogs is potential existing habitat for black-footed ferrets. Existing surveys and field inspections have not documented any prairie dog towns within the analysis area.

Bald Eagle - Small numbers of eagles winter along the Big Sandy River and the Flaming Gorge Reservoir but use of the project area is likely to be limited to occasional hunting flights in search of small mammals. The area has existing winter habitat for eagles that provides a prey base of fish and waterfowl, primarily along the watershed of the Flaming Gorge Reservoir. Winter food supply for eagles includes but is not limited to: small mammals, winter kill deer and antelope along crucial winter ranges, and perhaps road kill along Highway 530.

Peregrine Falcon - Peregrine falcons are dependent on high, steep cliffs for nesting in open areas overlooking bodies of water that support high numbers of waterfowl and large nesting colonies of small songbirds. This species is unlikely to establish residency in this area but may be present along the Flaming Gorge Reservoir on occasional hunting trips or during migration.

Whooping Crane - The whooping crane is a very rare bird in North America, with the only population breeding in northern Alberta and wintering in the Arkansas Refuge on the Texas coast. This species winters in marshes and preferred habitats include prairies and fields possessing abundant grains. This species is not expected to occur in the analysis area.

Ute Ladies' Tresses - This plant species is dependent on wet meadows below 6,000 feet elevation. No populations are known to occur within the analysis area.

Preble's Shrew - This species is dependent on insect larvae, earthworms, spiders, and snails for their survival. Preble's shrew is primarily nocturnal but may be active throughout the day to satisfy its diet (it has a high metabolic rate). This species burrows below the surface and is known to exist within the analysis area.

Pygmy Rabbit - This small cottontail is found in sand hummocks and sandy washes throughout the analysis area. Recent population declines of all cottontails within suitable habitat is probably a result of the long-term drought conditions experienced in Southwest Wyoming since 1987.

Spotted Bat - One of North America's rarest bats, it feeds primarily on moths. Mostly a solitary species which resides in crevices along rocky cliffs as well as canyons. No known populations exist within the analysis area.

Ferruginous Hawk - The ferruginous hawk was a common resident throughout the Green River Basin until the late 1980s. Nesting activity has declined in all suitable habitats within the United States over the last seven years. It is unclear why this is occurring but is currently being studied.

Northern Goshawk - No documented sightings of this species have occurred within the lease analysis area. The preferred habitat of goshawks consists of dense conifer dominant mixed woodlands and remote stands of big timber. Primary prey species include red squirrels, crows, and other species directly associated with dense timber stands.

Mountain Plover - This species has not been documented to occur within the analysis area. Mountain plovers prefer high, dry short grass prairies and plains as well as semi-desert areas. Suitable habitat exists in the analysis area but is primarily seasonal. Ground surveys conducted in the Wold Trona analysis area found no evidence of this species.

Loggerhead Shrike - This bird has declined in numbers throughout the United States over the past 15 to 20 years. Several active nest sites were known to occur on Dry Sandy Creek during the 1970s. General observations of the habitat indicate fewer nesting pairs within the analysis area although no formal inventory has been conducted in recent years. Loggerhead shrikes inhabit open areas with scattered shrubs where it feeds on insects (Bystrak 1983). Research done for the Wold Trona analysis area concluded that this species is relatively common and widely distributed during the summer months.

White Faced Ibis - This species nests and feeds in fresh water marshes with an abundance of insects, fish, and crustaceans. No known populations have been observed in the analysis area but potential habitat exists on the Henry's Fork and along Flaming Gorge Reservoir.

Black Tern - This species inhabits marsh areas where it is dependent on dense populations of insects. Potential habitat exists in the analysis area but no known populations are known to occur.

Long Billed Curlew - Curlews breed on dry prairies and wet meadows, and feed in salt marshes and mud flats. Potential breeding and feeding habitat exists within the analysis area.

Listed Fish Species - The four fish species listed as endangered by the FWS (Colorado squawfish, humpback chub, bonytail chub, and razorback sucker) historically inhabited the Green River drainage system but presently are limited to the Green River below the Flaming Gorge Dam. The Colorado squawfish and the humpback chub prefer shaded slow-moving waters and pools while the bony tail chub and razorback suckers like swift moving, deep channels.

Two candidate fish species, classified as Category 2 (C2), occur in the Green River drainage system and include the flannel mouth sucker and the roundtail chub. Both species have exhibited adaptations to high currents but have also been known to exist in eddies associated with the Green River system and tributaries to the Green River.

SPECIES	**SCIENTIFIC NAME**	**STATUS**
Colorado squawfish	Ptychocheilus lucius	Endangered
Humpback chub	Gila cypha	Endangered
Bonytail chub	Gila elegans	Endangered
Razorback sucker	Xyrauchen texanus	Endangered
Flannelmouth sucker	Catostomus latipinnis	C2
Roundtail chub	Gila robusta	C2

Candidate Plant Species- Five C2 plant species (taxa for which current information indicates that proposing to list as endangered or threatened is possible, but information on file is insufficient to support listing) potentially occur in the lease analysis area.

Beaver Rim thistle (*Cirsium aridum*) is endemic to the Green River Basin and several other west central Wyoming basins. This species has been observed on light colored Green River sandstone and marlstone. Sites are generally fine-textured and dry.

Ownbey's thistle (*Cirsium ownbeyi*) grows on shaley slopes in sparsely vegetated desert shrub communities. Two known local occurrences are in and near the Flaming Gorge NRA.

The large-fruited bladderpod (*Lesquerella macrocarpa*) is endemic to the Great Divide and Green River Basins of Wyoming. It occurs in Gardner's saltbush communities on barren fine-textured clay or shale soils of slopes, flats, and benches.

Opal phlox (*Phlox opalensis*) was recently discovered growing on shaley soils of the Green River Formation near Opal, Wyoming. It is known only from Lincoln and southwest Sweetwater Counties. This species could occur in the project area on relatively rocky clay slopes and flats.

The Green River Greenthread (*Thelesperma caespitosum*) was also recently discovered growing on fine-textured white shale soils of the Green River Formation. Only two populations of this species are known to exist. It potentially occurs in the project area on shaley or gravelly sandstone-ash outcrops.

General floristic inventories, cooperatively funded by the BLM and the Rocky Mountain Herbarium (University of Wyoming), are currently in progress. Results of the studies will be finalized in spring of 1996, and will provide additional information about the vegetation of the project area.

HAZARDOUS MATERIALS

There are no known sites contaminated with hazardous materials/ substances in the lease analysis area.

COINCIDENTAL DEVELOPMENT - OIL AND GAS RESOURCE

Currently, there are five oil and gas leases, held by three lessees within the tracts proposed for leasing. The leases, lessees, and expiration dates are shown in Table 2.

TABLE 2

OIL AND GAS LEASES WITHIN LEASE ANALYSIS AREA

LOCATION		O/G LEASE NUMBER	LESSEE	EXPIRATION DATE
TRACT A				
Section	20	WYW-105012	Marshall, Winston	07/31/1997
	28	WYW-113107	Tricontinental Resources	**06/10/1994***
		WYW-90681	William H. Short, Jr.	**01/31/1995***
		WYW-88575	TMB Trust	**10/31/1994***
TRACT B				
Section	22	WYW-104188	Maguire Mac	05/31/1997
	26	WYW-0114036	Vastar Resources Inc.	10/31/1998
TRACT C				
Section	14	WYW-104188	Maguire Mac	05/31/1997
	24	WYW-114036	Vastar Resources Inc.	10/31/1998
TRACT D				
Section	06	WYW-98363	J&M Investment Company	**04/05/1993***
	08	WYW-98363	J&M Investment Company	**04/05/1993***
	12	WYW-104188	Maguire Mac	05/31/1997
TRACT E				
Section	30	WYW-82253	Black Hills O&G Co.	**08/02/1993***

LOCATION		O/G LEASE NUMBER	LESSEE	EXPIRATION DATE
TRACT F				
Section	20	WYW-82[illegible]53	Black Hills O&G Co.	**08/02/1993***
	28	WYW-100899	Sensor O&G Inc.	**09/01/1994****
	34	WYW-105482	Vastar Resources Inc.	08/31/1997
		WYW-101758	Vastar Resources Inc.	10/31/1996
TRACT G				
Section	06	WYW-111557	UP Resources	**09/20/1994***
	08	WYW-111557	UP Resources	**09/20/1994***

* Expired
** Terminated

COMPARATIVE VALUE - TRONA, OIL AND GAS

The BLM is providing this information to assist the reader in making a general comparison of relative monetary value between a defined area of minable trona and a defined area of an oil and gas reserve. It should be noted that the trona resource is well defined and evenly distributed within a confined area. Oil and gas reserves, on the other hand, are far more dispersed within a given area.

Trona Reserves

A single bed of trona, 8 feet thick within a square mile area may contain 14.8 million tons of in-place trona of which approximately 7.4 million tons would be recoverable. The conversion rate of trona into soda ash is 1.8/1.0 (it takes 1.8 tons of trona to produce 1 ton of soda ash). Using a selling price of $75/ton, a 50% recovery rate, and the existing 5% federal royalty rate; a square mile of trona converted into soda ash would generate approximately $309 million in revenue and approximately $15.45 million in royalty payments. The royalty rate may change in the future.

Oil and Gas Reserves

The Projection is for a single natural gas well within the Frontier and Dakota Formations, the most likely to produce within the analysis area. A square mile within the Frontier Formation may contain in-place reserves of 12,400,000 MCF (thousand cubic feet). Assuming an 80% recovery rate, a selling price of $2/MCF, and a 12.5% royalty rate, this would generate approximately $19.84 million in revenue and $2.48 million in royalty payments. A similar natural gas well within the Dakota Formation would generate approximately $17.44 million in revenue and $2.18 million in royalty payments.

EXISTING MINING OPERATIONS

There are five trona mines and soda ash processing plants west of the City of Green River. In addition, another facility processes soda ash into consumer products. Approximately 90% of the natural soda ash produced in the United States in 1993 came from Wyoming. Wyoming produces between 8 and 9 million tons/year of soda ash. Table 3 shows the capacity of current soda ash producers.

TABLE 3

SODA ASH PRODUCTION IN MILLIONS OF TONS

COMPANY	CAPACITY
FMC Wyoming Corporation	2.85
General Chemical	2.40
Solvay Mineral Incorporated	2.00
Rhône-Poulenc of Wyoming	2.30
Texasgulf Soda Ash Incorporated	1.30

FMC has recently announced a 750,000 ton/year expansion, bringing their total soda ash capacity to 3.6 million tons/year. The Wold Trona Company may begin construction of the newest mine and plant facility in the summer of 1995. The Wold plant is expected to produce 1.25 million tons/year of soda ash.

RECREATION AND VISUAL RESOURCES

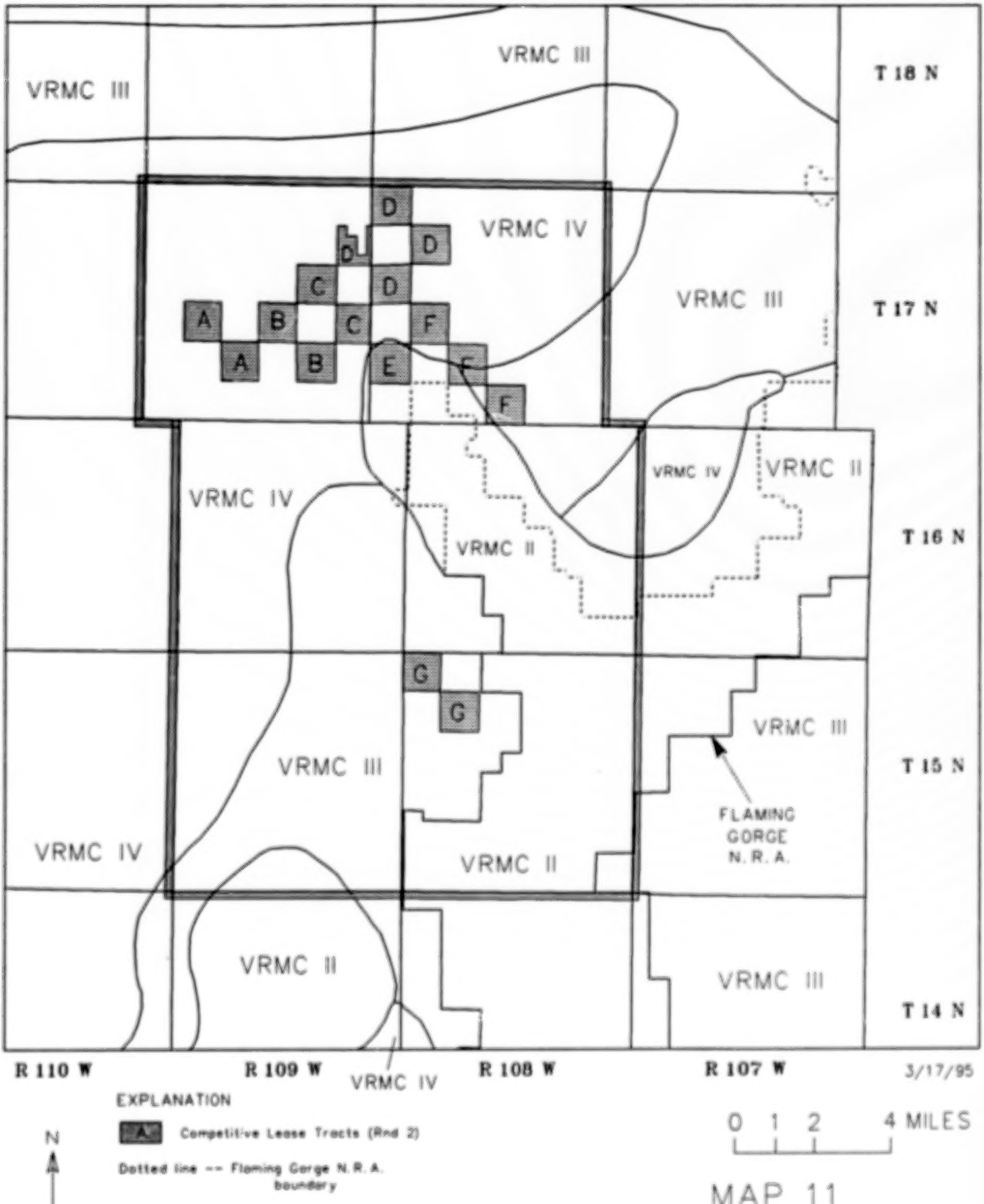
Recreation

Recreation activities in the analysis area include primarily dispersed recreational uses. The most frequent uses include antelope and sage grouse hunting, rock hounding, and four-wheel drive touring. The proposed tracts for leasing are near the Blacks Fork River and the Flaming Gorge NRA. Recreational activities occurring along the Blacks Fork and the NRA are water-oriented.

The Devil's Playground/Twin Buttes Wilderness Study Area (WSA) is approximately 5 miles south of the analysis area. The WSA is characterized by highly eroded badlands devoid of vegetation but with scattered patches of sagebrush, grass, and juniper. The most prominent points are Black Mountain and Twin Buttes, both large mesas located in the west central and southern portions of the WSA. The WSA's size and abundant topographical diversity created by numerous drainages provide ample screening so that outstanding opportunities for solitude can be found throughout the WSA. Outstanding opportunities for hiking, backpacking, horseback riding, photography, and sightseeing abound within this WSA.

Visual Resources

The analysis area falls within the desert plateau type of landscape. The plateau is flat but has been highly dissected by stream action. All but one tract available for leasing fall within the Visual Resource Management (VRM) Class IV lands. The objective of Class IV is to provide for management activities



MAP 11
VISUAL RESOURCE
MANAGEMENT CLASSES

that require major modification of the existing character of the landscape. Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, and texture) inherent in the characteristic landscape.

The southern tract (G) is within VRM Class III lands. The objective of the class is to design proposed alternatives to partially retain the existing character of the landscape. Contrasts to the basic elements caused by a management activity may be evident and begin to attract attention in the landscape. However, changes should remain subordinate to the existing landscape. Since much of the analysis area contains sagebrush and desert shrub vegetation communities, any surface disturbance is subject to obvious visual disruption because of the vegetation uniformity. Opportunity does exist, however, to disguise surface disturbing activities through the use of color and locating surface facilities behind landforms to lessen their impact to the viewer. Refer to Map 11 for visual classifications.

SOCIAL/ECONOMIC RESOURCES

The social and economic elements of the human environment have the most potential of being impacted by the proposed lease sale, especially if construction of one or two new mines occurs. A comprehensive description of the social/economic issues is presented in the Sodium EA (pages 61 through 76) and is further updated in the Wold EA (pages 3-55 through 3-67, and Appendix E-1 through E-9). For this discussion, the BLM has relied on the Wold Trona EA and the Sweetwater Economic Development Association to provide the latest available data. The findings are summarized below.

Local Economy

The economy of southwestern Wyoming is dominated by the extraction and processing of natural resources. The analysis area and the adjacent region sit within major oil and gas fields. Several coal mines are located to the east of the analysis area.

Mining is the largest employing sector in Sweetwater County, as shown in Table 4. It provided 5,423 jobs in 1992 or 22.6% of the total employment and is considered a basic industry (i.e., one that brings revenue into the local economy). Total employment reached 24,038 jobs in 1992.

TABLE 4

EMPLOYMENT BETWEEN 1989 AND 1992

INDUSTRY TYPE	1989	1990	1991	1992
Agriculture	326	337	335	337
Mining	4,744	5,001	5,328	5,423
Construction	1,300	1,464	1,409	1,607
Manufacturing	532	736	689	707
Transportation/Utilities	2,019	2,002	1,972	1,962
Wholesale Trade	761	650	673	659

INDUSTRY TYPE	1989	1990	1991	1992
Retail Trade	3,520	3,751	3,954	3,990
Finance, Insurance, Real Estate	1,081	1,049	1,074	1,073
Services	3,460	3,621	3,813	4,079
Federal Government (civilian)	262	265	258	266
Military	240	227	228	260
State/Local Government	3,406	3,525	3,690	3,675
Total Employment	21,651	22,628	23,387	24,038

Source: U.S. Department of Commerce, Bureau of Economic Analysis and Equality State Almanac, Department of Administration and Information, 1994.

Currently, five trona mining and soda ash processing plants and one consumer product manufacturer (from soda ash) are in operation. If approved, one new trona mine and soda ash processing plant (Wold) will be under construction within the near future and is expected to employ 454 workers (direct and indirect employment) during the peak construction phase and employ 371 workers (direct and indirect employment) during the operational phase. It is expected that the population of Sweetwater County will increase by over 300 individuals once the mine is operational.

Other basic industries include the coal mines, a coal-fired electric power generating plant, a phosphate fertilizer processing plant, and numerous oil and gas wells and related production and transportation facilities. In addition, American Methanol, Ltd. (a methanol producer), is expected to employ 250 workers during peak construction and 26 permanent workers (Braddock 1995).

The significance of the trona industry to the local economy can be proven by its contribution to the tax base, and Wyoming's share of annual federal royalties based upon the annual level of production. Accordingly, the revenues applicable to trona production for the year 1992 are reflected in Table 5.

TABLE 5

1992 TRONA PRODUCTION TAXES AND WYOMING SHARE OF FEDERAL ROYALTY*

Total Assessed Valuation from trona production	$195,116,349
Estimated Ad Valorem Tax Levied	$ 14,256,761
Estimated Severance Tax Collectible	$ 10,731,399
Federal Royalty Disbursement	$ 6,707,520
Total Production Tax and Wyoming Share of Federal Royalty	$ 31,695,680

* Does not include rentals and/or bonus

All levels of government provided approximately 17.5% or 4,201 jobs in 1992. The service industry provided 17.0% and the retail trade sector provided 16.6% of the 1992 employment rate. Both the service and retail trade employment levels reflect the importance of tourism and the travel economy associated with U.S. Interstate 80 (I-80), and the importance of the Rock Springs-Green River area as a regional commercial center. Additionally, the construction sector is also important to the economic health of Sweetwater County. Employment rates in the construction industry ranged between 1,300 and 1,600 workers during the four-year period ending in 1992 and was primarily related to expansion of existing industrial facilities and some construction of new commercial facilities. Construction employment levels have increased since 1989.

Total personal income in Sweetwater County has increased at an average rate of 8% per year for the years 1989 through 1992, for a total of $683 million in 1992 as shown in Table 6. Personal income is provided as follows: mining sector 42%, government 14.3%, and transportation 11.6%. The other employment sectors, each contributing less than 10%, collectively provided the remaining 32.1% of personal income.

TABLE 6

PERSONAL INCOME BY MAJOR INDUSTRY IN SWEETWATER COUNTY ($000s)

INDUSTRY TYPE	1989	1990	1991	1992
Agriculture	476	538	676	734
Mining	219,297	242,150	272,640	287,202
Construction	33,725	41,791	37,106	45,685
Manufacturing	15,579	26,329	28,443	30,312
Transportation/Utilities	71,820	73,459	76,509	79,265
Wholesale Trade	21,458	16,718	16,828	18,148
Retail Trade	40,175	44,385	47,379	51,001
Finance, Insurance, Real Estate	9,065	9,491	10,254	9,836
Services	48,964	51,702	57,369	63,838
Federal Government (civilian)	8,633	9,140	9,454	10,489
Military	1,468	1,469	1,481	1,794
State/Local Government	71,117	75,877	83,564	85,237
Total Personal Income	541,777	593,049	641,703	683,541
Per Capita Personal Income (dollars)	15,125	16,724	18,086	18,730

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Equality State Almanac, Department of Administration and Information, 1994.

Population

Population in Sweetwater County reached a peak of 45,752 in 1982 and has since fluctuated based upon the cyclic nature of the mineral extraction industry. Since 1990, population has increased from a low of 38,823 to approximately 40,000 in 1994. Most of the population resides in or around the communities of Green River and Rock Springs. Approximately 1,950 residents live in the Bridger Valley area and just over 200 full-time residents live in the Manila, Utah area. It should be noted that the development (construction phase) of the Wold Trona Mine is expected to increase the population level of Sweetwater County by over 300 individuals. The American Methanol project will also increase the permanent county population by approximately 5 to 15 individuals (Braddock 1995).

Housing

The housing situation in the Rock Springs/Green River area has not changed much from the initial housing inventory done for Wold Trona Company in the summer of 1993 (Kot, Anselmi 1995). New "high-end" housing units have been constructed in the last two years, leaving some more moderately priced units for sale. However, the housing market remains extremely tight if one is in the market to purchase a moderately priced home.

Vacant mobile home pads are readily available, however. Vacancy rates for motel units, as with trailer pads and rentals, is seasonal with a greater demand during the summer months, depending on industrial construction projects and the tourist season.

Local Government Facilities and Services

The population of Sweetwater County is lower than its peak in the early 1980s. Thus, with some exceptions, local government facilities and services are adequate for the current population. Primary exceptions are a lack of physicians although several new physicians have recently moved into the area. Another concern is a lack of space in the Green River middle and high schools. However, construction of a new high school in Green River has recently begun.

A new water system for the Rock Springs area is currently under construction and should be completed within a year or two. Some recreational services (i.e., softball, football, soccer) may be near or at capacity.

Transportation

The regional transportation system serving Sweetwater County includes an established system of interstate, state, and county highways. A railroad, and commercial and general aviation services are also available.

Wyoming highway 530 (WY 530) provides the primary access into the analysis area. It is also the city of Green River's main north/south thoroughfare. Sweetwater County road 4-1 (CoRd 4-1; located 16 miles south of Green River, WY) could also provide access into the analysis area although the roadway would require substantial upgrading. Use of both roads is heaviest during the summer months. The west side of Flaming Gorge NRA is accessed by recreationists using WY 530. Generally speaking, approximately 710 vehicles and 80 commercial trucks use WY 530 between the southern limit of the city of Green River and CoRd 4-1 junction each weekday (rates may be higher during the summer months). I-80 provides the only access between Rock Springs and Green River and WY 530.

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CHAPTER IV

ENVIRONMENTAL IMPACTS

INTRODUCTION

Leasing is an administrative action that does not cause direct impacts upon the human environment. Thus, a discussion of direct impacts is not warranted in this document since surface disturbance is not proposed. However, the act of leasing could result in significant indirect impacts upon the human environment due to development of the leases.

In awarding leases, the BLM grants the lessee certain rights to develop the leased mineral. However, issuing leases does not grant approval for development of the leased mineral. Any future development would be subject to the appropriate level of site-specific environmental analysis and approval of necessary permits by federal, state, and local agencies.

The purpose of this discussion is to address whether additional mitigation measures should be attached to the leases in order to prevent undue or unnecessary degradation to public lands managed by the BLM.

Cumulative impacts will be provided under a separate section and will include all ongoing activity in combination with expected reasonable development should leases be issued. The boundary for cumulative impact discussion will include all actions within the KSLA boundary.

Reasonable Development Scenario and Assumptions

Development of the sodium resource within the 16 sections may entail development of at least one 2.5 million ton/year mining operation with an associated 1.25 million ton/year monohydrate soda ash plant. In addition, it is foreseeable that a second, smaller mine and plant to develop trona resources held by Church and Dwight could be developed. This mine could produce 2.0 million tons/year with an associated 1.0 million ton/year surface monohydrate plant.

Current data show that such a development scenario would require surface disturbance associated with each mine/plant site to be approximately 1,100 acres, assuming that any future plants will use a wet process to convert trona into soda ash. It is reasonable to expect that these mine/plant sites would be constructed on public land, private land, or, most likely, a combination of both. A typical mining description and anticipated refining methods, updated from that described in the Sodium EA, can be found in Appendix D. Expected associated facilities would include access and haul roads, railroad spurs, powerlines, telephone lines, tailings ponds, sewage lagoons, landfills, and natural gas and water pipelines. It is expected that such a mine/plant site would employ between 150 and 250 workers.

The BLM cannot accurately predict locations of such facilities. Therefore, the impact analysis will address potential impacts based upon these generic assumptions and may identify additional mitigation measures relevant to all or individual leases to eliminate or reduce unnecessary environmental degradation.

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Subsidence and Tailings Pond Reclamation

Two issues deserve special mention. In light of the recent mine collapse at the Solvay Mine, concerns have been raised about potential impacts of mine subsidence occurring especially if it were to occur under a perennial stream or other area containing year round water. The BLM has addressed potential impacts based upon the generic assumptions related above. This issue can only be specifically addressed at the development stage and potential impacts would be based upon the mining method employed and pillar size, among other factors. Subsidence can be limited through properly planned underground mining. Specific mine plans will be reviewed by BLM Mining Engineers for ore recovery rates and subsidence potential at the time of resource development.

The second issue of concern is reclamation of tailing ponds. At this time, the potential for successful reclamation of tailings ponds is unknown. None of the existing trona-based tailings ponds have been reclaimed. Trona mines have an expected life span in excess of 100 years; therefore, construction of tailings ponds would be considered a long-term commitment of the affected resources. Technology and experience with successful reclamation of other types of tailings piles, ponds, or areas have proved that reclamation of tailings can be done. The BLM will assume then, that successful reclamation of these areas will eventually occur.

Significance Criteria

Significance criteria describes the threshold or magnitude at which a potential impact could be considered significant; thus, warranting additional special mitigation measures to eliminate or reduce an impact, or perhaps requiring preparation of an EIS should development eventually be proposed in an area containing important resource values. Significance criteria will be identified at the beginning of each resource section, based upon regulatory standards, available scientific documentation, previous environmental documents, and the professional judgement of the resource specialists.

AIR QUALITY

Significance Criteria

National ambient air quality standards reflect the total amounts of specific pollutants allowed in the atmosphere: carbon monoxide (CO), lead, nitrogen dioxide (NO_2), ozone, sulfur dioxide (SO_2), and particulate matter (either TSP or PM-10). State standards include these parameters but may also be more stringent than federal standards (e.g., Wyoming's TSP, ozone, 24-hour, and annual SO_2 standards are more stringent). These standards were established to protect public health (primary standards) and public welfare (secondary standards).

For many years, the particulate matter standard included all size ranges of particulate. Measured values were dominated by fugitive dust particles that are larger than those produced in combustion processes, settle relatively quickly, and present minimal health threats. The EPA recognized these limitations by setting new standards for particulate matter at less than 10 microns in diameter, commonly called inhalable particulate and abbreviated as PM-10. The TSP standard will be phased out over time.

Areas that consistently violate minimum federal standards because of human-caused activities are classified as "nonattainment" areas, and a plan must be implemented to reduce ambient levels below the maximum pollution standards. Areas without documented standard violations may be designated as "attainment" or

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"unclassified" (i.e., neither classified as "attainment" nor "nonattainment"). "Unclassified" areas are generally exempt from having to follow the offset provisions, retrofit controls, and new source control requirements established for "nonattainment" areas.

To protect areas not classified as "nonattainment," Congress established a system for the Prevention of Significant Deterioration (PSD) through the Clean Air Act amendments of 1977. Areas were classified by the additional amounts of degradation that would be allowed. PSD Class I areas, predominantly national parks and certain designated wilderness areas, are the most restricted; virtually any degradation would be considered significant. Areas where moderate, controlled growth can take place are designated as PSD Class II. PSD Class III areas are those areas that allow the greatest degree of impact from pollutants.

Additional requirements to protect "Air Quality Related Values" - including impacts to visibility, flora, fauna, etc. - are applicable to new facilities, or major modifications to existing facilities, with the potential to emit more than specified amounts of certain air pollutants. Table 7 summarizes the applicable standards and increments. As described in Chapter III (Affected Environment), the analysis area has been designated as either "attainment" or "unclassified" for all pollutants and is designated PSD Class II.

The State of Wyoming may also establish additional significance criteria. For example, the WDEQ, Air Quality Division, has chartered a steering committee to carry out the Green River Basin Visibility Study (GRBVS). The GRBVS mission is to establish a baseline of visibility currently present in the Green River and Ham's Fork Basins of southwest Wyoming. The steering committee's objectives are:

- -- to characterize the current status of air quality in terms of: 1) visual range, 2) extinction budget, 3) photometric data, and 4) seasonal, annual, or other episodic variation; and
- -- to establish and update a source inventory that includes point, area, and regional sources.

TABLE 7

APPLICABLE AIR QUALITY STANDARDS AND INCREMENTS
(Micrograms per cubic meter)

Pollutant	Avg. Time	Federal Primary	Federal Secondary	State	Incremental Class		
					I	II	III
CO	1-hour	40,000	40,000	40,000	na	na	na
	8-hour	10,000	10,000	10,000	na	na	na
Lead	Quarter	1.5	1.5	1.5	na	na	na
NO_2	Annual	100	100	100	2.5	25	50
Ozone	1-hour	235	235	160	na	na	na
TSP	24-hour	na	na	150	10	37	75

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Pollutant	Avg. Time	Federal Primary	Federal Secondary	State	Incremental Class		
					I	II	III
	Annual	na	na	na	5	19	37
PM-10	24-hour	150	150	150	8	20	60
	Annual	50	50	50	4	17	34
SO_2	3-hour	na	1,300	1,300	25	513	700
	24-hour	365	na	260	5	91	182
	Annual	80	na	60	2	20	4

NA - not applicable
Note: All standards (other than annual and quarterly) are not to be exceeded more than once per year.

It is anticipated that an IMPROVE (Interagency Monitoring Protected Visual Environments) monitoring station will be established to gather needed data for the GRBVS. This study is a cooperative effort between government, industry, and private interests. The foundation of the study rests in the application of current scientific and technological tools to investigate and characterize visibility in the basins.

Indirect Impacts

Given the preliminary nature of this EA, no quantification of potential impacts is possible at this time. Once a development proposal is submitted indicating production rates, mining, and development processes, transportation methods, employment levels, etc., a detailed assessment of potential impacts and specific control technologies will be prepared. In all cases, applicable local, state, and federal air quality laws, regulations, and statutes will apply and be strictly enforced.

Under the described development scenario, air quality is currently affected by fugitive dust from local roads and open, exposed lands. Operation of up to two additional trona mining facilities has the potential to increase particulate matter emissions during removal and storage of trona, processing trona to extract soda ash, storage of tailings, and from exposed areas before reclamation. The BLM will and the State of Wyoming may require reasonable control methods to be applied to reduce the amount of fugitive emissions (i.e., wetting, surfacing, or other methods). If processing facilities include generation of power or steam heat, gaseous pollutant impacts (NO_2 and SO_2) and secondary particulate emissions (nitrates and sulfates) are likely. The operator would be required to obtain a construction and operation air pollution permit from appropriate state agencies.

No Action Alternative

Under the No Action Alternative, the existing situation would continue. Emissions from existing industrial facilities in the general area would continue. Expansion of existing facilities and construction of new industrial sites would add to the overall level of emissions.

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Additional Mitigation Measures

The following additional measures are recommended to reduce potential impacts:

> Material crushers and processing facilities should have air pollution control measures as required by the State of Wyoming.
>
> If exposure to the public is reasonably likely, additional requirements for continuous particulate and/or gaseous pollutant monitoring is recommended.

CULTURAL RESOURCES

Significance Criteria

In any instance where qualities of a cultural resource that would qualify for inclusion in the National Register of Historic Places are affected, either directly or indirectly, by proposed activity, there exists a potential for effect. Resources may qualify for inclusion under one or more of the following criteria. A property may be registered if it has:

A) an association with events that have made a significant contribution to the broad patterns of our history;

B) an association with the lives of persons significant to our pasts;

C) an embodiment of distinctive characteristics of a type, period, or method of construction/representation of the work of a master; or

D) yielded, or may be likely to yield, information important in prehistory or history.

Effects that occur to any qualities that would qualify a given resource under criteria A, B, or C cannot be mitigated and produce a *de facto* adverse effect. Usually, those resources that qualify exclusively under criterion D can have damages to these qualities mitigated through implementation of an appropriate data recovery program.

Prehistoric Resources

Most of the prehistoric resources within the general area do not qualify for inclusion within the National Register of Historic Places. Of those that do meet the qualifications, almost all would qualify under criterion D. Exceptions of note to this would be PaleoIndian resources. Archaic sites containing the remains of structures, bison/antelope impoundments/jumps, or any sites that retain sacred/respected values to modern Native American groups (e.g., petroglyphs, stone circles, medicine wheels, cairns, rock alignments, burial grounds, etc.). The potential for these site types is low and it is likely that effects to prehistoric resources will not result in an adverse effect, given appropriate planning.

Historic Resources

Little is known about the historical resources of the general area. There are likely to be some historical resources in the area that qualify for inclusion with the National Register of Historic Places. Most of the historical resources presumably will not qualify. It is unlikely that many of these sites will be associated with historic personalities or significant events (except for the trail resources). However, new information may change that view. Ranches, graves, corrals, mines, campsites, inscriptions, and other resources are likely to occur within the proposed lease area. In most instances, effects to historical sites can easily be avoided and should not be adversely affected by mining providing there are sufficient planning and flexibility to consider these resources.

Historic Trails

The presence of unevaluated trails could be of concern. Trails, such as the Cherokee Trail, are considered eligible for inclusion in the National Register of Historic Places under criterion A. Accordingly, potential impacts to the qualities that make this resource eligible could result in an adverse effect. At present, the BLM has insufficient information concerning the condition of these trails and the location of the facilities to determine if there will be an effect. Potential placement of up to two mines and processing plants on a horizon overlooking intact trails segments would likely result in an adverse impact to the trail if the qualities of the setting make up part of the trail's significance. Setting will be the hardest quality to avoid affecting. Sites associated with the trails (i.e., fords, campsites, massacre sites, graves, inscriptions) would be likely to qualify under criteria A and/or D and might not be possible to mitigate.

Commercial use of qualifying trail segments (if any exist) would be an adverse effect. Given the presence of so much trail, support facilities such as the railroad, pipelines, and powerlines should be carefully considered to avoid adversely affecting intact trail segments.

Stipulations outlined in Chapter II should provide adequate protection to cultural resources and to intact trail segments once these trail segments have been evaluated.

No Action Alternative

Under this alternative, no potential impacts would occur to prehistoric and historic sites or historic trails.

Additional Mitigation Measures

No additional mitigation measures have been identified.

GEOLOGY AND PALEONTOLOGY RESOURCES

Significance Criteria

Sedimentary rocks may be described as having high (or known) potential for sensitivity in containing significant paleontological resources, low potential, or undetermined potential.

-- High Potential: Sedimentary units with a high potential for containing significant paleontological resources are those that are shown by literature, museum records, and field surveys to have produced or to be very likely to produce vertebrate fossils or significant invertebrate or plant fossils. Units with high potential may be so designated throughout their extent, or only in areas/lithologies that are especially productive.

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- Low Potential: Sedimentary units that have been studied may be found, through literature, museum records, and field surveys, to have produced few significant fossils. These units are judged by a qualified paleontologist to be unlikely to produce significant fossils in the course of surface disturbance.

- Undetermined Potential: Sedimentary units for which no known published or unpublished information exists have undetermined potential for producing significant paleontological resources. Field surveys are to be performed by a qualified paleontologist to make a specific determination of high or low potential and to develop a program of mitigation as necessary.

Indirect Impacts

The lease analysis area contains two formations that fall into the High Potential category: Green River Formation and Bridger Formation. The magnitude and duration of impacts to possible paleontological resources would depend on the location and extent of facilities and the extent to which bedrock would be disturbed during construction. Other possible impacts to paleontological resources include improved access if development occurs which can lead to increased collection of fossils by the public. A possible beneficial impact to paleontological resources would be the recovery of significant fossils as a result of disturbance caused by construction.

The only impact to other geologic resources would be the removal of the trona itself and possible subsidence as a result of mineral development. Up to several feet of subsidence could occur over areas of underground mining. However, if proper precautions are taken, subsidence would not be noticeable on the surface except by surveying.

If development were to occur within or near the Blacks Fork floodplain, facilities could be affected by flooding. However, no surface facilities, other than ancillary utilities, would be allowed within one-half mile of floodplains. Windblown sand in some areas could complicate certain construction operations. The magnitude of any potential impacts from geologic hazards would depend upon the amount, type, and locations of future development.

No Action Alternative

The existing situation would continue to occur under this alternative. Trona will be mined by existing operators in areas north and west of the lease analysis area and a new mine will soon be constructed (if approved) within the lease analysis area. Thus, the potential to unearth paleontological resources and discovery of significant fossils would continue to occur due to these other developments. However, trona in these lease tracts would not be disturbed. Subsidence could potentially occur on existing leases as they are mined.

Additional Mitigation Measures

No additional mitigation measures have been identified.

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SOILS/EROSION

Significance Criteria

Soil management objectives for the Green River and Kemmerer Resources Areas, and therefore for this EA, are to stabilize and conserve soils and to increase vegetative production. Given these management objectives, the following criteria are used to determine the significance of potential impacts to soils within the analysis area:

- Noncompliance with management direction;
- A reduction in soil productivity in such a manner that lowered productivity reduces or prevents disturbed areas from achieving predisturbance productivity levels; and
- Location and construction of project facilities on special management soils (soils having one or more of the following characteristics: difficult reclamation potential, high erosion potential; slope gradients greater than 25%) without the use of special construction methods.

Indirect Impacts

Topsoil quality in the analysis area varies based upon topography and parent material. Primary soil limitations are: shallow depth to bedrock, high coarse fragment content, salinity, minimal soil development, and subsequent low resiliency. Thus, should development occur, construction activity would expose soils to accelerated erosion, increased sedimentation into local drainages, and may cause degradation of soil quality.

Construction of tailings ponds would be considered an a long-term commitment of the soil and vegetation resource. Reclamation success rates are unknown at this time but the BLM assumes the technology will be available to reclaim these areas when necessary.

Any future surface disturbance would have to comply with WDEQ's Non-Coal Rules and Regulations (1993) and the proponent would be required to prepare a stormwater discharge plan according to federal and state requirements. This, in addition to the stipulations listed in Chapter II, should reduce potential soil impacts to levels not considered significant.

No Action Alternative

No potential disturbance to soils; thus, no increased potential for erosion would occur under this alternative. Other on-going and future developments are likely to occur which would lead to surface disturbance and increase potential for wind and water erosion.

Additional Mitigation Measures

No additional measures have been identified.

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VEGETATION

Significance Criteria

The BLM Wyoming Policy on Reclamation (Instruction Memorandum No. WY-90-231) states, "Nearly all authorizations of surface disturbing actions are based upon the assumption that an area can and shall ultimately be reclaimed," and "The Wyoming primary long-term goal for reclamation is the eventual ecosystem reconstruction." This means to return the land to a condition approximately or equal to that which existed before disturbance or to a stable and productive condition compatible with standards described in the land use plan.

To properly analyze the impacts to the vegetation resource, the assumption is that the vegetation will be returned to a condition "approximate or equal to that which existed prior to disturbance" unless otherwise specified. Under Assumption Guidelines in the Green River Resource Management Plan Draft EIS (1992) "In the 7-9-inch precipitation zone, stabilizing vegetative ground cover would occur in 2-3 years. Brush establishment/invasion to create a vegetative landscape similar to adjacent land would occur in 15-20 years."

Impacts to vegetation resulting from the proposed project would be considered significant if they resulted in:

-- a permanent reduction in vegetation productivity or a permanent change in species composition; or

-- discharge of materials into waters thereby adversely affecting vegetation of aquatic sites and wetlands.

Indirect Impacts

Disturbance of surface lands and construction of access roads, plant facilities, tailings and discharge ponds, water and monitoring well sites, and other structures indirectly associated with trona leasing and any future development would reduce and eliminate vegetation. This loss of vegetation would result in a forage loss to livestock and wildlife, and a loss of security and nesting cover for wildlife. The duration of the reduction in total vegetation on project areas would depend on the degree of success of reclamation and revegetation efforts.

A number of factors affect revegetation success, including:

1) quantity and quality of topsoil available for post- mining reclamation;
2) seed mixture design;
3) revegetation techniques applied to the disturbed areas;
4) annual precipitation during initial stages of revegetation efforts;
5) the materials and workmanship actually incorporated into final reclamation and revegetation efforts;
6) grazing pressure on rehabilitated sites by livestock and wildlife; or
7) unauthorized recreational use of rehabilitated sites.

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Currently, the success rate for reclamation of trona tailings ponds is unknown. Construction of tailings ponds would be considered a long-term commitment of the soil and vegetation resource but the BLM assumes that the technology will be available to reclaim these areas when needed.

Any future construction and operation activities would affect vegetation by increasing the potential for establishment of weeds and competition on the disturbed areas.

There is potential for disturbance of up to 2,200 acres that could be lost as a forage base for livestock and wildlife. The BLM is unable to predict exactly how much of that disturbance would be reclaimed shortly after disturbance and how much would be disturbed over the life of the development. Regardless, the BLM assumes that all areas not needed for surface facilities would be reclaimed shortly, or within one year, after disturbance.

Reclamation and revegetation technology currently exists to return disturbed areas to predisturbance productivity, cover, and density. Except for halogeton (*Halogeton glomeratus*), few designated or noxious weed species are capable of surviving in the semiarid conditions within the study area. Based on revegetation results from nearby roadways, pipelines, and other disturbances that are properly reclaimed and revegetated, weeds are not expected to be a long-term problem on disturbed areas.

Therefore, most of the impacts would not be considered significant if the long- and short-term goals of reclamation and revegetation are successful. The single, most serious impact could be the long-term loss of vegetation due to the construction and use of tailings ponds. The BLM would require the appropriate level of environmental analysis at the development stage and would then require construction, containment, lining, fencing, or other appropriate mitigation using the latest technological advances.

No Action Alternative

Under the No Action Alternative, the existing situation would continue.

Additional Mitigation Measures

Potential disturbance for tailings ponds would be considered a long-term commitment of the soil and vegetation resource. However, technology in mining and reclamation methods is quickly advancing and site-specific mitigation measures would be better identified at the time of development. Thus, the following mitigation measure is recommended:

> To ensure protection of waterfowl, shorebirds, migratory birds, other wildlife, and domestic animal species, and to aid in successful reclamation of tailings ponds, the lessee shall be required to design protective measures in consultation with the BLM, FWS, WGFD, WDEQ, and other federal, state, and local agencies having administrative jurisdiction.

RANGE RESOURCES

Significance Criteria

Impacts to livestock/grazing management would be considered significant if there were a reduction in AUMs of a magnitude that would require modifications in the grazing allotment or other actions that would prevent realization of existing grazing management goals.

Indirect Impacts

The Granger Lease Allotment contains just under 30,000 AUMs, the Henry's Fork Allotment contains over 30,000 AUMs, and the Rock Springs Grazing Allotment contains more than 109,000 AUMs (includes all lands regardless of ownership). The lease analysis area contains approximately 6,469 AUMs (533 AUMs in the Granger Lease Allotment, 744 AUMs in the Henry's Fork Allotment, 3,471 AUMs in the Rock Springs Grazing Allotment, 1,617 AUMs in the NRA, and 104 AUMs on state controlled land).

Up to 2,200 acres could be disturbed if development occurs. Thus, a maximum of 163 AUMs (based upon 13.46 acres per AUM) could be lost. Assuming that those areas not needed for surface facilities would be reclaimed shortly after disturbance, the actual number of AUMs lost over the long term would be less; therefore, the impacts to grazing management would be considered negligible.

With development comes the potential for new roads and railroad spurs that could increase the chances for vehicle-livestock collisions. Depending where surface facilities are located and what areas are fenced, livestock use patterns within the area could be altered.

Numerous 2-track trails exist within the lease analysis area, some of which could be reclaimed to help compensate for lost AUMs if construction of surface facilities were to occur.

No Action Alternative

The existing situation would continue to occur under this alternative. There would be no additional changes in livestock use patterns and the potential for increased vehicle-livestock collisions would occur as a result of construction and operation of the Wold Mine and American Methanol developments.

Additional Mitigation Measures

Opportunity exists to require some of the 2-track trails within the lease analysis area to be reclaimed in order to help compensate for lost AUMs, if construction of surface facilities were to occur. Any reclamation of 2-track roads would be subject to public input and surface owners preference.

SURFACE/GROUND WATER

SURFACE WATER

Significance Criteria

If the following criteria were to be exceeded, impacts to surface water would be considered significant:

- noncompliance with the water quality management objectives in the Kemmerer RMP and the Green River RMP Draft EIS;
- degradation of water quality such that state standards outlined in the Rules and Regulations of the Water Quality Division of the WDEQ are not met;
- alteration of channel geometry or gradients that produce undesirable effects such as aggradation, degradation, or side-cutting;

- modification of quantity or quality of streamflows such that it affects established users;
- noncompliance with the Federal Clean Water Act; and
- loss of surface water in perennial streams or ponds due to subsidence caused by mining.

Indirect Impacts

Exposure and compaction of the soil surface in the area occupied by surface facilities and construction of impermeable structures (i.e., buildings, pavement, gravel, etc.) would decrease infiltration capacities, increasing surface runoff, erosion, and off-site sedimentation. Storm runoff could be a concern. Although somewhat infrequent, storms can produce a significant amount of runoff during a 100-year, 24-hour rainfall of 2.2 inches (Miller, et al. 1973). However, any surface facilities would be designed under a "zero discharge concept" in accordance with appropriate state regulations.

Since sewage disposal would be via a properly designed septic system in accordance with WDEQ and Sweetwater County requirements no significant impacts are expected. The system would be placed in an appropriate location near the surface facilities.

Intermittent/ephemeral surface water and shallow ground water could be affected by leakage or spill of process fluids or poor quality ground water used for industrial purposes. Water supply and processing facilities would be designed to reduce the potential for contamination of ground and surface water and would be monitored for leakage.

Construction of mine access roads and rail lines would involve channel crossings. The construction and operation of channel crossings could alter streamflow, erosion/sedimentation, and channel course and morphology. Crossing sites should be selected where the active channels are of minimal width and bounded by gradual slopes. The channels are dry much of the year. Crossing structures should be designed for 25-year peak flows. Crossings should be designed to reduce restriction to natural flow velocities and associated upstream sedimentation and downstream scour. Ice associated with spring thaws should also be factored into the design. Although the crossings are frequently dry, the channels are active. Therefore, any crossings would require authorization from the U.S. Corps of Engineers.

Improper road construction could result in erosion by runoff, particularly at the discharge end of culverts and in ditches on steep slopes. Sound civil engineering practices should be incorporated in road design and construction to include culvert sizing and erosion control measures at the discharge end of culverts and ditches on steep slopes. Implementation of these steps would reduce sedimentation impacts to surface water caused by mine roads.

In the event of a mine collapse there is a chance that surface water may be affected by changes in the channel bed elevation and diversion into any fissures that may have formed. The depth of the mine below the surface would most likely provide some protection from mine flooding by surface waters or at least, delay the process. Although infiltration of surface waters into the mine is a minor concern in comparison to the other problems with a mine collapse, it should be considered as part of the analysis process.

With implementation of the stipulations outlined in Chapter II, no significant impacts are anticipated. However, subsidence potential would be fully addressed during the development review stage.

No Action Alternative

Under the No Action Alternative, surface water resources would remain as they are. Development not associated with this action would continue and water resources would continue to be affected by existing and future developments.

Additional Mitigation Measures

No additional mitigation measures have been identified.

GROUND WATER

Significance Criteria

Impacts to ground water resulting from potential development would be considered significant if:

- quantity or quality of the available potable ground water declined to the extent that these waters would no longer be suitable for stock, domestic, or industrial use; or
- dewatering or mixing of ground water aquifers due to mining activity.

Indirect Impacts

Potential impacts to ground water due to surface activity may include contamination caused by spills of any hazardous materials or substances used during any phase of development or operation, and potential for ground water contamination due to water soluble materials leaking from settling ponds (if ponds are constructed). Another potential impact could arise if tailings pond liners fail and subsequently leak into existing aquifers.

A large-scale surface subsidence, like the one recently experienced at Solvay, could possibly lead to serious impacts if fracturing of the rock within the collapse area provided for aquifer mixing or infiltration of surface waters, whether from existing streams or from surface facilities such as tailings ponds. Placement of surface facilities should be designed to consider these possibilities.

Aquifers could be penetrated by mine shafts but any shafts would be grouted to seal off ground water.

The degradation of shallow ground water could occur if boreholes and wells are not properly completed or abandoned. Ground water occurring below 400 feet in the analysis area generally has sufficient head to flow to the surface in an open borehole. An improperly cased and cemented well could allow poor quality water to flow uphole outside the casing into shallow, freshwater zones.

Implementation of the stipulations outlined in Chapter II should be adequate to protect ground water and potential impacts are not considered significant. Subsidence potential can only be addressed at the development stage based upon a site-specific mine plan.

No Action Alternative

The existing situation would continue. Selecting this alternative would not prevent these types of potential impacts from happening at existing mines or other areas of disturbance.

Additional Mitigation Measures

No additional specific measures have been identified. However, the impacts of possible subsidence should be addressed in detail at the development stage. Refer to the Vegetation section for suggested mitigation for tailings ponds.

WETLAND/RIPARIAN/FLOODPLAINS

Significance Criteria

Because of the crucial importance of wetland, riparian, and floodplain areas and their limited acreage within the analysis area and the District, any unnecessary activity within these areas or any activity without appropriate and complete mitigation, as described under the surface occupancy criteria and mitigation sections in Chapter II, would be considered significant. It should be recognized that most disturbances are unacceptable in wetlands, riparian zones, or floodplains.

Indirect Impacts

Within the Rock Springs District, riparian areas represent less than 1% of the total land surface under the jurisdiction of the BLM (i.e., public lands). Even so, wetland/riparian community is a crucial habitat for most of the wildlife species that inhabit the area, supporting them for part or all of their life history. The wetland/riparian zone is within the larger floodplain and is instrumental in reducing flood flow energy, retaining sediment, and recycling nutrients in addition to other typical functions that occur within a floodplain. The trona lease area is extremely dry, and the importance of a healthy, functioning wetland/riparian zone along the Blacks Fork River and floodplain is even more critical than that of areas where water is more abundant.

No plant, mill, sewage lagoon, or tailings pond would be allowed within one-half mile of either side of existing perennial waters. All tailings ponds would be designed to withstand consecutive 100-year floods. Should no alternative exist but to locate ancillary facilities (i.e., roads, utilities) within or across these areas, special site-specific mitigation measures would be applied during the development stage, depending upon the proposal.

The stipulations identified in Chapter II should provide adequate protection for these crucial areas.

No Action Alternative

The existing situation would continue under the No Action Alternative.

Additional Mitigation Measures

No additional mitigation measures have been identified.

WILDLIFE/FISHERIES

WILDLIFE

Significance Criteria

Potential impacts associated with this project would be considered significant if:

- noncompliance with FWS, BLM, or WGFD agreed upon management objectives for wildlife, including big game species, sage grouse, raptors, and special status species;
- a collective increase in the direct mortality to wildlife directly related to road kill, poaching, harassment, or any other cause exceeding existing levels of mortality that would affect the population goals;
- the displacement of animals from crucial habitats during vital use periods; or
- direct loss of a sage grouse lek or raptor nest.

Indirect Impacts

Future development could affect existing populations of wildlife as well as wildlife occurring in the analysis area on a seasonal basis to some extent. The impacts of roads, other surface facilities, tailings and discharge ponds, and increased human presence may affect the stability of the ecosystem. Wildlife displacement would occur as a result of construction, transportation, and operations.

The primary impacts of development include but are not limited to individual as well as population displacement, longevity of the mine in relation to direct habitat loss caused by long-term surface facilities, and increased accessibility to wildlife which could pose a threat due to increased potential for illegal harvesting as well as harassment of wildlife.

Big Game

Pronghorn Antelope - Potential disturbance to antelope exists as a threat of displacement on a year round basis but more importantly from crucial winter range. However, with similar habitat available adjacent to the project area and the minimal activity throughout the general area, potential impacts would not be considered significant on a long-term basis provided that additional major surface disturbing activities do not occur in the area.

Mule Deer - Potential disturbance to mule deer in the analysis area would occur in the form of increased human activity and habitat destruction. Development activities have the potential to displace mule deer out of portions of the analysis area. Mule deer utilize riparian areas of the analysis area, primarily during the summer season. The loss of vegetation resulting from facility and road construction is not expected to significantly affect the deer population on a long-term basis.

Upland Game Birds

Sage Grouse - Sage grouse are common in the analysis area and special stipulations outlined in Chapter II are designed to protect breeding areas and leks. Any future surface disturbing activities would be subject to the appropriate stipulations based upon the proposed development.

Sage grouse nesting and wintering areas will be maintained to protect and improve nesting and foraging cover through the preservation of sagebrush communities.

Mourning Dove - Doves are seasonal residents of the analysis area throughout the summer months. Breeding as well as nesting occurs in summer ranges. Displacement of preferred nest sites may occur but additional nest sites within the area would be developed if disturbance occurs prior to nest construction.

Waterfowl, Shorebirds, and Neotropical Songbirds

No impact is expected to occur along riparian areas or standing waters since surface disturbance is restricted within one-half mile of open waterways. Therefore, no significant impact to waterfowl or shorebirds is expected to occur within the analysis area. Future construction of tailings or discharge ponds would be designed to implement the latest technology (i.e., netting, hazing devices, pyrotechnics, or other devices) to prevent unnecessary destruction of waterfowl or shorebirds.

Since neotropical songbirds are primarily migratory and remaining in the analysis area on a seasonal basis, no significant impact would be expected.

Raptors

Five species of raptors have been known to nest within the analysis area. These species include the golden eagle, prairie falcon, red-tailed hawk, great horned owl, and the kestrel. The golden eagle is a resident of the analysis area and the other raptor species nest in the general area and migrate out in the fall. Raptor surveys and restrictions place on activities within 1/2- to 1-mile of an active or historic nesting site would prevent significant impacts to raptors using the area.

FISHERIES

Significance Criteria

Potential impacts to fisheries would be considered significant if:

- increased instream siltation results in long-term reduction in downstream fish populations;
- stream channelization, culvert and bridge installations, or dewatering alters fish habitat that results in long-term reduction of fish populations; or
- uptake or discharge of water used for hydrostatic testing of pipelines or mine and ore processing operations causes dewatering of fish waters or alters the fish habitat which results in long-term fish populations.

Indirect Impacts

Should development occur, construction and operation activities have the potential to deposit sediments or, in case of accidental spills, toxic substances into stream courses during high water runoff that could potentially affect fish populations. Any future development would be subject to the stipulations outlined in Chapter II and subsequent environmental analysis could further define additional measures to protect fish habitat and populations.

All surface facilities would be designed to reduce or eliminate water erosion and contingency plans would be required to address accidental spills of hazardous or toxic substances. Therefore, leasing and possible development would not cause significant impacts to fisheries.

No Action Alternative

The existing situation would continue to occur under this alternative. Fish populations would continue to be affected by existing and future development.

Additional Mitigation Measures

The mitigation measures outlined in Chapter II are sufficient to protect fisheries and no additional measures have been identified.

SPECIAL STATUS SPECIES

Significance Criteria

The FWS has determined that five species of plants and animals, and four species of fish which have been listed as either threatened or endangered have the potential to exist within the analysis area. Leasing of these tracts would not cause a direct impact to special status species since no surface disturbance is proposed under this action. However, indirect impacts due to potential development could have an adverse impact on these species. Impacts would be considered significant if:

-- the biological assessment provided through the site-specific environmental analysis, according to Section 7 (c) of the Endangered Species Act of 1973, makes a "may affect" determination. The BLM must then initiate formal consultation with FWS;

-- the project directly or indirectly impacts the potential rate of recovery for any species of concern;

-- development results in the loss or death of threatened, endangered, or candidate species; or

-- development was to jeopardize or substantially decelerate the recovery program of any threatened, endangered, or candidate species.

Threatened and Endangered Species

Black-Footed Ferrets - Black-footed ferrets are dependent upon prairie dog colonies. Any future proposal for surface disturbance near prairie dog towns would be subject to field surveys for ferrets. The

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stipulations outlined in Chapter II are adequate to protect this endangered species, and potential development is not likely to adversely affect ferret populations.

Bald Eagle - Chapter II stipulations require surveys for all raptor nesting areas prior to surface disturbance. If active or historically active nests are within 1/2- to 1-mile of the proposed disturbance area, seasonal and distance restrictions would apply. Therefore, bald eagles are not likely to be adversely affected.

Peregrine Falcon - Since this species is unlikely to establish residency in the analysis area, any future disturbance is not likely to adversely affect this falcon.

Whooping Crane - This species is not likely to be adversely affected since this crane is not expected to occur in the analysis area. Potential habitat exists within the analysis area but any crane in the vicinity would be strictly accidental.

Ute Ladies' Tresses (plant) - This species is not likely to be adversely affected since it is dependent upon wet meadows below 6,000 feet, conditions that do not occur in the analysis area.

Endangered Fish Species - Four fish species (Colorado Squawfish, Humpback Chub, Bonytail Chub, and Razorback Sucker) listed as endangered by the FWS have historically inhabited the Green River Drainage. Although these endangered fish species of the Colorado River System currently exist only downstream from the Flaming Gorge Dam, water from the Upper Green River Basin affects the downstream habitat of these species of fish. Under the Recovery and Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, any water depletions from tributary water (the Blacks Fork River) within the Colorado River drainage are considered to be jeopardizing to the continued existence of these fish.

Candidate Species

Ten candidate species have the potential to occur in or adjacent to the lease analysis area.

Preble's Shrew - This species could occur within the analysis area. Stipulations outlined in Chapter II require surveys for special status species in known or potential habitat. If this species is found, the BLM would coordinate with FWS and WGFD to determine appropriate action. Therefore, future development would not likely contribute to the need to list this species.

Pygmy Rabbit - Stipulations in Chapter II would be adhered to since this species could occur within the analysis area. Thus, potential development would not likely contribute to the need to list this species.

Spotted Bat - This species is not known to occur in the analysis area and is not likely to be affected.

Ferruginous Hawk - Raptor nest surveys and seasonal/distance restrictions would apply if found. Future development is not likely to contribute to the need to list this hawk.

Northern Goshawk - This species is not likely to be affected since it has not been documented in the area for the last several years.

Mountain Plover - This species has not been documented within the analysis area, nor was it found during surveys for the Wold project. However, future development would be subject to the stipulations in

Chapter II that would require surveys (between April and July) in potential habitat areas. Actions proposed are not likely to contribute to the need to list the plover.

Loggerhead Shrike - A general observation of the habitat indicates few nesting pairs within the analysis area although no formal inventory has been conducted in recent years. Efforts should be initiated to determine the status of this species. A determination of status would be required prior to surface disturbance. Thus, future development would not contribute to the need to list the loggerhead shrike.

White Faced Ibis - Potential habitat of this species should be inventoried to determine status within the analysis area. Surveys prior to surface disturbance in known or potential habitat would be required before surface disturbance. Such actions are not likely to contribute to the need to list the ibis.

Black Tern - Potential habitat exists within the analysis area but populations are not known to occur. Habitat inventories should be conducted for this species. If found, stipulations in Chapter II would apply and such actions are not likely to contribute to the need to list the black tern.

Long Billed Curlew - Potential breeding and feeding habitat exists in the lease analysis area. Inventories to determine status should be conducted. Stipulations in Chapter II would apply to any proposal for surface disturbing activities. These actions are not likely to lead to the need to list this curlew.

Candidate Fish Species - Two candidate fish species classified as Category 2 (C2) include the flannel mouth sucker and roundtail chub. These species occur along the Green River and its tributaries. Implementation of the stipulations listed in Chapter II should provide adequate protection and potential development is not likely to lead to the need to list these fish species as threatened or endangered.

Additional Mitigation Measures

Due to the highly alkaline nature of tailings ponds, the additional mitigation measure identified under the section entitled Vegetation would also apply under Wildlife and Special Status Species. Please refer to the Vegetation section for specific wording. In addition, the following mitigation measure is recommended:

> The FWS has determined that all depletions of water from the Colorado River System are likely to adversely affect threatened and endangered fish species of the Colorado River. Section 7 formal consultation with the FWS is required. To offset project depletion impacts to the listed fish species of the Colorado River System, the lessee will be required to make a one-time contribution to the FWS Colorado River Endangered Fish Recovery Program. The one-time contribution will be based upon the average annual depletion anticipated by the lessee or operator and the FWS specified rate per acre foot of depletion.

HAZARDOUS MATERIALS

Significance Criteria

Release of a hazardous substance (as defined by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended) is considered to be significant if a release exceeds the reportable quantity for that hazardous substance. Reportable quantities of individual hazardous substances are found in the Consolidated List of Chemicals Subject to Reporting Under Title III of the

Superfund Amendments and Reauthorization Act of 1986, as amended. Copies of this publication may be obtained from the EPA.

Release of oil (including but not limited to petroleum, fuel oil, crude oil, oil refuse, and oil mixed with wastes) would be considered to be significant if a release exceeds standards in the Wyoming Department of Environmental Quality's Regulations for Releases of Oil and Hazardous Substances into Waters of the State of Wyoming, Chapter IV (W.S. 35-11-301 and 35-11-302).

Indirect Impacts

Hazardous substances or oil based materials in the analysis area could affect the environment (soil, water, air) and human health/safety. Should construction, mining, or soda ash processing activities occur, human injury or damage to sensitive resources could result from release of hazardous substances or oil materials in excess of reportable quantities. Standards on reportable quantities of the materials have been set by regulatory agencies such as EPA and WDEQ. The stipulations outlined in Chapter II should protect the environment from undue or unnecessary degradation and any potential impacts would be considered negligible.

No Action Alternative

Under this alternative, hazardous materials/substances used in trona mining and soda ash production will continue to be used. The potential for release of these materials in excess of reportable quantities will therefore continue to exist. All operators, however, are mandated to comply with regulatory requirements regarding the release of hazardous materials/substances.

Additional Mitigation Measures

No additional measures have been identified.

COINCIDENTAL DEVELOPMENT - OIL AND GAS - TRONA RESOURCES

Significance Criteria

Development of oil and gas leases in such a manner that it would cause seepage or leakage of natural gas into the trona bed or mine would be considered a significant impact. In addition, development of a trona mine in an oil and gas development area in such a manner that it would damage an oil and gas well causing seepage or leakage of natural gas into the trona mine would be considered significant.

Indirect Impacts

Impacts that could occur in the proposed lease tracts include impacts of oil and gas drilling within the leased blocks prior to mining and impacts associated with drilling for oil and gas following mining.

None of the existing oil and gas leases contain a "No Surface Occupancy" stipulation. Therefore, the BLM would require additional environmental analysis to determine the impacts of concurrent development. The BLM will use the "first in time, first in right" principle as the basis for a decision until an alternative policy is developed by the JIC and approved by the BLM.

No producing wells are located within the analysis area. The intent of the JIC study is to develop standards for which oil and gas, and trona can be developed concurrently with minimal impact to either entity. Thus, no conclusions relative to impacts can be made at this time.

No Action Alternative

The existing situation would continue. Conflicts between oil and gas development and trona development will continue until coincidental development issues are resolved by the JIC and adopted by the BLM.

Additional Mitigation Measures

No additional mitigation measures have been identified.

IMPACTS ON EXISTING MINING OPERATIONS

Significance Criteria

Developing significance criteria to assess the potential impact on existing producers is extremely difficult. Future development would, obviously, impact existing operators to some extent simply due to increased competition. The BLM cannot identify an objective threshold of impact where anything above or beyond would be considered significant to existing operators. There are too many perspectives.

Existing operators would likely feel that development of any new mining operation and processing plant would threaten their production rates by either increasing excess production and thereby reducing the selling price, or by limiting short-term growth rates. The affected operators would consider either situation as very significant. But from the standpoint of the American public, it makes sense to increase royalties collected from development of the sodium resource. It is the responsibility of BLM to assure that this mineral be properly developed to ensure that ***ultimate maximum recovery*** of the federal mineral deposit is achieved (43 CFR 3590.0-5).

The bottom line, however, is that economic factors and product demand will ultimately dictate the level of development and whether expansion of soda ash production would be warranted. The BLM expects the lessee or operator to conduct appropriate economic studies prior to committing to development.

Indirect Impacts

The impacts associated with up to two additional soda ash facilities in addition to the Wold soda ash facility would be the potential for excess capacity, increased competition, reduced selling prices, and reduced short-term growth. Production from the leases is dependent on market conditions. If the market conditions do not warrant expansion, expansion will not occur.

Increased or continued sodium production associated with new leasing could increase employment and related economic activities for selected local communities and maintain community stability, depending upon where specific tracts are developed. Communities affected could be temporarily harmed if housing and support services are inadequate to accommodate increased populations.

No Action Alternative

Selection of the No Action Alternative would deny leasing of specific public lands for trona mining as proposed earlier in this document. Mining of existing beds of trona and expansion of existing facilities to meet national as well as international demand would continue. The American public would be denied collection of royalties under this alternative and the BLM objectives would not be realized.

Additional Mitigation Measures

No additional mitigation have been identified.

RECREATION

Significance Criteria

Impacts to recreation use would be considered significant if the land use or activity would result in long-term displacement of recreational use or if there were increased evidence that human activity would reduce recreation users' perceived levels of isolation and solitude.

Indirect Impacts

Dispersed recreational activities could be slightly affected if development occurs. The primary impacts would be to antelope hunting. Access roads and aboveground facilities could displace antelope, decreasing hunter success in the area. Impacts to other dispersed recreation activities would be negligible. Access to Flaming Gorge NRA should not be affected.

The Devil's Playground/Twin Buttes WSA is approximately five miles south of Tract G and over 14 miles away from the northern tracts. Topographical features within the WSA provide a high level of screening from activities outside the WSA. Most likely, the WSA would not be affected by leasing and possible future development other than air quality issues. Any future development would be subject to the appropriate level of environmental analysis.

No significant impact to recreational activities is anticipated.

No Action Alternative

Existing recreation activities would continue under this alternative.

Additional Mitigation Measures

No additional measures have been identified.

VISUAL RESOURCES

Significance Criteria

Impacts to visual resources would be considered significant if BLM VRM guidelines were violated over the long term.

Indirect Impacts

Most of the tracts proposed for leasing fall within VRM Class IV lands. The remaining tract (Tract G) is within VRM Class III lands. Surface disturbing activities should not adversely affect the visual resource management classifications in the analysis area with implementation of the stipulations outlined in Chapter II. Aboveground structures would be painted with nonreflective finishes that harmonize with the adjacent natural setting. Roads would not be engineered in straight lines which should reduce the "tunnel" effect.

No Action Alternative

Visual classifications will remain the same. Leasing of the proposed tracts would not occur under this alternative but existing mining operations would continue. Thus, impacts to visual resources would continue as is.

Additional Mitigation Measures

No additional measures have been identified.

SOCIAL/ECONOMIC RESOURCES

Looking to the future, if and when the proposed leased trona will be developed is at best somewhat conjectural, particularly as to the time and extent of impact due to development and production. Accordingly, the social/economic impacts will be largely portrayed in general terms.

Significance Criteria

Assessing when economic activity is considered significant can be difficult. Economic activity is usually considered to be a positive impact, particularly to those who directly benefit from such activity (i.e., business owners, increase in employment rates, etc.). However, there can be negative impacts to the community (i.e., lack of housing, overcrowded public facilities, etc.). The following significance criteria are from the Wold EA (see page 4-68 and 4-69) and used for this discussion.

- Demographic impacts involving a greater than 10% annual increase in a local area population. This is based on the assumption that such growth would strain the ability of the affected communities to provide housing and services, or otherwise adapt to growth-related social and economic changes.

- An aggregate change in revenue flows and expenditures likely to result in an inability of the affected units of government to maintain public services and facilities at established service level standards.

- Any permanent displacement of residents from affected areas, identifiable changes in or conflicts with existing ways and life, or levels of dissatisfaction likely to generate organizational response and conflict.

Indirect Impacts

A comprehensive description of the social/economic impacts is presented in the Sodium EA (pages 94 through 113) and is further described and updated in the Wold EA (pages 4-68 through 4-85). Social/economic impacts in Sweetwater County would continue to be felt, mostly in the cities of Green River and Rock Springs. Lesser impacts could occur in the Bridger Valley area of southeastern Uinta County, Wyoming, particularly to the town of Lyman, and in the community of Manila, located in Daggett County, Utah.

The analysis area and the adjacent region continue to be major natural gas, coal, and trona producing areas. Southwest Wyoming has had a series of "boom and bust" economic periods.

Forecast of population for the state and the county in addition to soda ash production have been provided by the State of Wyoming and are presented in Table 8.

TABLE 8

POPULATION AND SODA ASH PRODUCTION PROJECTIONS

YEAR	1993	1996	2000	2003
Population - Sweetwater County	40,618	41,300	42,080	42,580
Population - Wyoming	469,695	478,520	488,540	495,170
Soda Ash Production (000s tons)	8,870	9,350	10,350	11,390

Sources: Wyoming Economic Forecast Report, Department of Administration and Information, July 1994 and Equality State Almanac, Department of Administration and Information, 1994.

This data shows that the population of Sweetwater County will continue to grow approximately 0.5% each year which is approximately the projected rate of growth for the rest of the state.

Soda ash production shows an annual growth rate of 3%. However, current plant expansions, construction of the new Wold facility, and other activities suggest a greater rate of growth. Labor to construct and operate these projected facilities could increase the population to levels higher than those presented here.

Mining will continue to be the largest employing sector in Sweetwater County. It is possible that the government sector - the second largest employer - may drop behind the service industry if statewide trends continue. Retailing and construction industries will continue to be prominent employers.

If the development scenario holds true, the effects of continued leasing, development, and mining of trona are estimated to increase permanent employment by 150 to 500 jobs once development is complete. This will increase personal income and provide a larger tax base for the area, including increases in sales and ad valorem taxes.

With a possible influx of newcomers, population growth in the area will naturally increase demand for housing, schools, medical, civic, and recreational facilities.

The potential contribution from the trona industry to the state, county, and local economy can be demonstrated by the contribution to taxes and the state's share of federal royalties. The revenues applicable to trona production of 2.0 million tons/year of soda ash created by future development of two new mining operations are reflected in Table 9.

TABLE 9

VALUE OF INCREMENTAL TRONA PRODUCTION TAXES AND SHARE OF FEDERAL ROYALTY[1]

Assessed Valuation, Production of Two Million Tons of Soda Ash per Year	$23,300,000
Estimated Ad Valorem Tax Levied	1,703,000
Estimated Collectible Severance Tax	932,000
Federal Royalty Disbursements	1,400,000
Total Production Tax and State Share of Federal Royalties	4,035,000

[1] Does not include rentals or bonuses. Sources: Minerals Management Service and State of Wyoming, Department of Revenue Report. 1993.

These data, using current prices and tax rates, show that approximately $4 million would be available annually to the state, county, and local governments.

Development of any new mining operation can cause serious problems for local communities, particularly if development occurs during an economic boom period. Therefore, should any future development occur, the proponent would be required to seek permits from the WDEQ, Industrial Siting Council. The council requires economic studies to determine the level of impact to local communities and may require impact assistance payments to help alleviate those adverse impacts.

In addition, transportation requirements of any future development would be subject to analysis, and appropriate mitigation would be developed at that time.

No Action Alternative

Under the No Action Alternative, the existing social/economic conditions and trends in the communities in and around the analysis area would continue. Because other resource development activities are ongoing or proposed, some increase in employment and population would be expected. Thus, approval of the No Action Alternative will not eliminate existing housing shortages or increasing demands for public services. Revenues generated from trona development under the proposed action would not be collected by federal, state, and local governments.

Additional Mitigation Measures

No additional mitigation measures have been identified.

CUMULATIVE IMPACTS

Introduction

The lease analysis area sits within the southeastern sector of the Green River KSLA (see Map 12). For this EA, the cumulative impact analysis area will be the KSLA with one exception, wildlife. The reason wildlife will not be addressed based upon the KSLA boundary is the fact that I-80, a major thoroughfare, runs through the KSLA on an east-west axis. Wildlife distributions north of the freeway do not have much bearing on wildlife distributions south of the freeway.

Currently, the only major industrial site occurring south of I-80 is Solvay Minerals although both the Wold Mine and American Methanol projects are planned for construction south of the freeway in the near future. In addition, the cumulative impact analysis area contains many existing 2-tracks and other improved and unimproved roads, approximately 152 well pads (producing or currently drilling), 52 abandoned wells, one natural gas processing plant, one compressor station, four more trona mines/processing plants and one consumer product manufacturing plant (north of I-80), 45 stock ponds, roughly 113 miles of fencing, 6 to 8 mineral material sites, and several "hot-mix" plant sites (temporary facilities used during highway reconstruction). Flaming Gorge NRA sits partially within the analysis area and the Devil's Playground/Twin Buttes WSA is located five miles south of the analysis area and is also partially within the KSLA.

The possible addition of up to two new mines south of I-80, with implementation of stipulations identified in Chapters II and IV, compliance with all federal, state, and local environmental regulations, and the appropriate level of environmental analysis for site-specific development proposals should not add significantly to the cumulative effect within the KSLA for the following resources or issues: geology/paleontology, cultural and historic resources, soils/erosion, surface or groundwater, vegetation, range resources, wetlands/riparian/floodplains, coincidental development, existing operators, or recreational resources. Although additional hazardous materials/substances will be used in mining and the processing of trona into soda ash, strict adherence to existing federal and state regulations should not add significantly to the existing situation.

The potential for development of up to two new trona mines in addition to the existing and proposed industrial activity could cause significant degradation to the overall air quality within the region, and particularly to the visual quality at Flaming Gorge NRA and the WSAs located south and southeast of the lease analysis area. The BLM cannot at this time predict the significance of air quality degradation based upon a site-specific proposal because none exists. The proponent of any future development would be required to address air quality issues in relation to conclusions reached from ongoing air quality studies within the general area and to address the cumulative impacts of the proposed development upon air and visual quality within the region. In addition, the proponent would be required to comply with federal and state air quality standards.

Another issue that could prove significant is the impact of possible development of up to two new mines on the social and economic well-being of the affected communities. Southwest Wyoming has experienced "boom and bust" periods previously and Sweetwater County officials have indicated they would prefer responsible economic development. Depending upon the economic climate at the time of proposed

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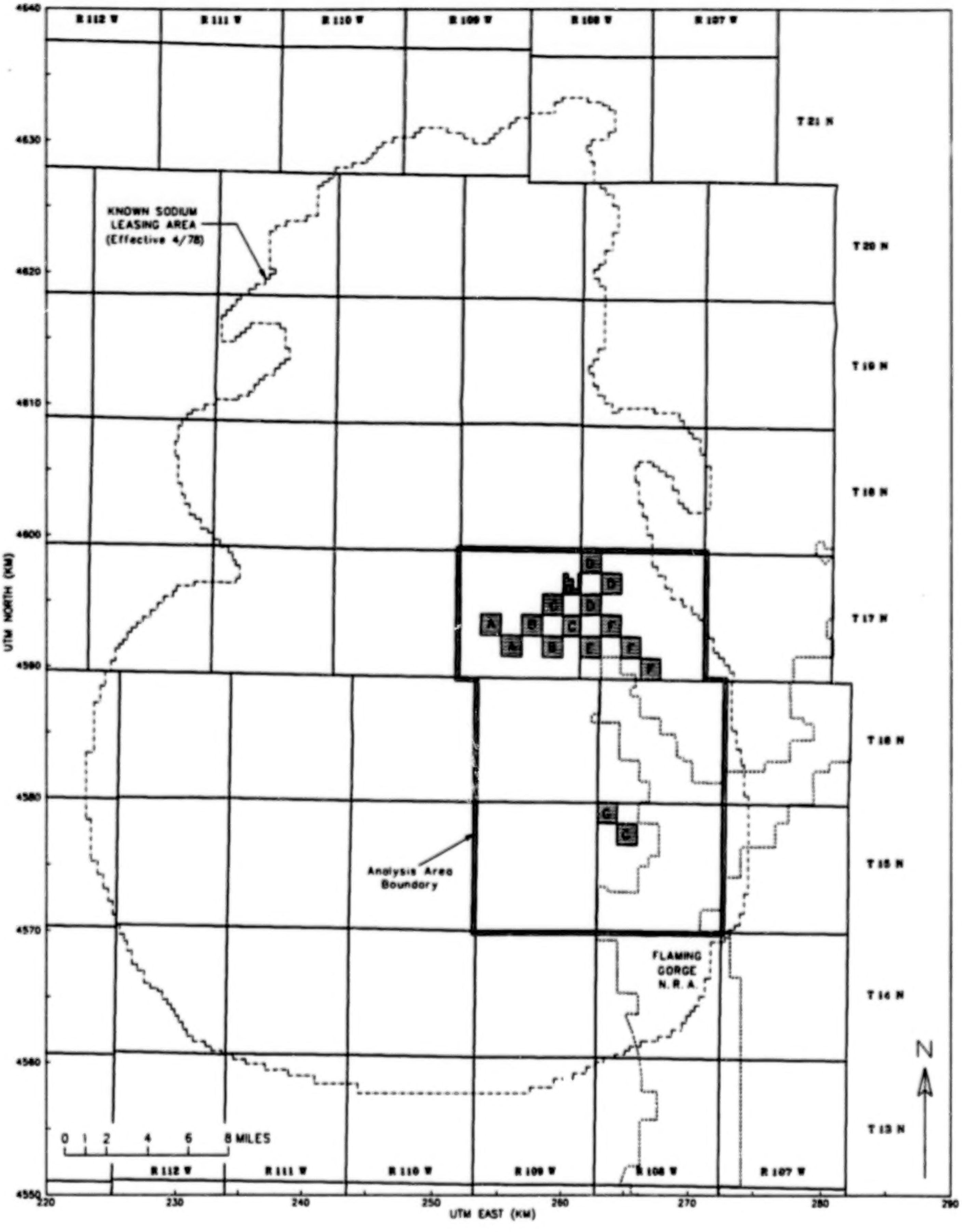


Map 12. Cumulative impact analysis area, Green River Basin, Wyoming.

development, two scenarios could occur: 1) significant problems could arise if a great number of people were to move into the region without adequate social infrastructure, or 2) little or no major impacts would be expected if development occurs during a "bust" period when affected communities could be experiencing population losses.

All current indicators predict steady economic development over the next few years and the potential for development of any new mine would be dependent upon world demand for soda ash. In this light, any future development would be subject to stipulations made by the Wyoming Industrial Siting Commission based upon recommendations made by local governmental agencies and the local population.

Development of long-term, well paying jobs would be considered a positive benefit for Sweetwater County and the surrounding communities.

Current oil and gas development is occurring on the western fringe of the KSLA within the Moxa Arch area located approximately 18 to 25 miles west of the analysis area. The potential for economically viable oil and gas development within the lease analysis area is considered low at this time. There are five abandoned wells in the lease analysis area and no producing wells although with advancing technology, there is potential for the situation to change however. Until coincidental development issues are resolved, any coincidental development would be subject additional site-specific environmental analysis.

The final issue that should be addressed is the impact to wildlife. The addition of up to 2,200 acres of disturbance would remove forage and cover for wildlife as well as possibly leading to degradation of water quality. If erosion control measures were ignored, it could cause increased siltation to live waters and in turn, possibly causing a decline in fish populations. Without proper design and mitigation, tailings ponds could pose a threat to any creature that wandered into them. Increased traffic could also lead to increased mortality of big game species and increased human activity (including noise) around development may cause wildlife to move away, or lead to increased harassment and possibly poaching.

Implementation of stipulations addressed in Chapters II and IV should help reduce the impact to wildlife and additional, site-specific measures could be developed during environmental analysis of any future proposal. All current and reasonably foreseeable development will lead to some level of impact on wildlife; however, no one at this time can say for sure how significant that impact would be. Obviously, analysis of any future development must take into account the potential impacts on wildlife and develop appropriate measures to reduce those impacts to acceptable levels. The BLM concludes that potential cumulative impacts to the area south of I-80 are not considered significant at this time. However, future analysis of site-specific development proposals will need to fully analyze impacts to these resource concerns.

RESIDUAL IMPACTS

Construction of new mines in addition to the Wold Mine may lead to a reduction of the visual quality for the traveling public along Highway 530 but the proper location of any new facilities should reduce those impacts to acceptable levels.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Construction of the plant sites, railroads, and related facilities could alter the topography. Railroad grades and road beds that require major cuts and fills may not be restorable to original topographical lines but vegetation restoration would be feasible.

Construction of tailings ponds is considered a long-term commitment of resources and reclamation success is unknown at this time. The BLM assumes advances in mining and reclamation technology will return these lands to a productive condition.

CHAPTER V

CONSULTATION

The Council of Environmental Quality regulations (40 CFR 1500-1508) require scoping to determine the issues and alternatives an environmental analysis should address. The purpose of scoping is to identify important issues and alternatives that require analysis and to eliminate insignificant issues and alternatives from analysis.

On September 12, 1994, the BLM issued a scoping notice (see attached notice) to federal, state, local agencies and representatives, existing trona operators, environmental organizations, and affected and interested parties. Twenty comment letters were received by the BLM. The attached Comment Summary provides a summary of issues brought forth by the public.

These public comments helped the BLM to determine the scope of the EA and clarified issues and concerns to the public. The BLM has addressed these issues to the extent possible for assisting the decision maker in making an informed decision.

LIST OF PREPARERS

NAME	LOCATION	RESPONSIBILITY
Ted Murphy	Rock Springs District	Team Leader
Teresa Deakins		NEPA Coordination, Document Preparation
John MacDonald		Soils Scientist
John Henderson		Riparian, Wetland, Floodplain, Fisheries
Allen White		Hazardous Materials
Dennis Doncaster		Surface Hydrology
Terry Del Bene		Cultural Resources
Angelina Pryich		Editor
Scott Archer	Federal Center - Denver	Air Quality
Ramsey Bentley	Pinedale Resource Area	Ground Water
John Pederson	Wyoming State Office	Social/Economics

NAME	LOCATION	RESPONSIBILITY
Joseph Lujan	Green River Resource Area	Wildlife, Special Status Species
Andy Tenney		Recreation, Visual Resources
Jon Kautt		Range
Carl Bezanson	Kemmerer Resource Area	Range
Gary McNaughton		Geology

LIST OF REVIEWERS

NAME	POSITION	AGENCY
Mark Kot	County Planner	Sweetwater County
Vern Rulli	Mining Engineer	BLM, Wyoming State Office
Ed Heffern	Geologist	BLM, Wyoming State Office
Ron Hilton	Environmental Scientist	BLM, Wyoming State Office
Renée Dana	Planning/Environmental Specialist	BLM, Rock Springs District
Wayne Sutherland	Environmental Scientist	BLM, Rock Springs District
Arlan Hiner	Biological Resource Advisor	BLM, Rock Springs District
Jeff Clawson	Mining Engineer	BLM, Rock Springs District
Scott Sanner	Mining Engineer	BLM, Rock Springs District
Anne Carey	Assistant District Ranger	USFS, Ashley National Forest, Flaming Gorge NRA

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Rock Springs District Office
P.O. Box 1869
Rock Springs, Wyoming 82901-1869

3520 (412c)
Trona

September 12, 1994

SCOPING NOTICE

PROPOSED SODIUM LEASING WITHIN THE GREEN RIVER BASIN

Dear Reviewer:

The enclosed document serves as notice of the beginning of an analysis process to fulfill requirements of the National Environmental Policy Act. If you are interested in participating in this process, we request you respond by supplying us with your written comments or concerns about the above-referenced proposed activity by October 14, 1994.

The comments/concerns received in response to the scoping will aid the BLM in identifying alternatives and assuring all issues are analyzed in the environmental analysis process. If you respond to this request, we shall keep you informed of decisions resulting from the analysis.

Please submit your responses to:

Ted Murphy
Chief Branch of Solid Minerals
Bureau of Land Management
P.O. Box 1869
Rock Springs, Wyoming 82902-1869

If you have any questions concerning this proposal, please feel free to contact Ted Murphy by stopping in at the Rock Springs District Office, or calling (307) 382-5350.

Sincerely,

John S. McKee
Associate District Manager

Enclosure

SCOPING NOTICE

PROPOSED SODIUM LEASING
WITHIN THE GREEN RIVER BASIN
SCOPING NOTICE

Bureau of Land Management
Rock Springs District
Kemmerer and Green River Resource Areas

DESCRIPTION OF PROPOSAL

In response to requests for competitive sodium leasing, the BLM is proposing to lease 12,619 acres (20 sections). The lands being considered for leasing are 16 sections containing 10,059 acres in addition to four sections containing 2,560 acres previously proposed for leasing.

Sodium leasing is authorized under the 1920 Mineral Leasing Act (MLA), as amended (U.S. Statute 30 USC 181 et seq. and is codified at 43 CFR 3520.) Under the MLA, sodium leasing is done competitively in any area designated as a Known Sodium Leasing Area (KSLA). A KSLA is defined as "lands known to contain valuable deposits of sodium and not covered by permits or leases, and which are subject to lease through competitive means." (43 CFR 3525.1).

The regulations implementing the MLA at 43 CFR 3520.3 set a lease acreage limitation of 5,120 acres in which one person or corporation can hold or acquire, either directly or indirectly.

The Bureau of Land Management proposes to hold a competitive sodium lease sale on 12,618.84 acres of public land and minerals in the following sections (see Map 1-3).

Lease Tract 1	T.18N., R.109W., Section 20 (640)
Lease Tract 2	T.18N., R.109W., Section 28 (640)
Lease Tract 3	T.17N., R.110W., Sections 10 and 12 (1,280)
Lease Tract 4	T.17N., R.109W., Sections 20, 22, and 28 (1,920)
Lease Tract 5	T.17N., R.109W., Section 26 (640)
Lease Tract 6	T.17N., R.109W., Sections 14 and 24 (1,193.60)
Lease Tract 7	T.17N., R.109W., Section 12 (563.10)
	T.17N., R.108W., Sections 6, 8, and 18 (1,913.82)
Lease Tract 8	T.17N., R.108W., Section 30 (638.80)
Lease Tract 9	T.17N., R.108W., Sections 20, 28, and 34 (1,920)
Lease Tract 10	T.15N., R.108W., Sections 6 and 8 (1,269.52)

BACKGROUND

Trona deposits in southwest Wyoming represent the largest known commercial source of natural soda ash in the world. Trona occurs in only a few places and rarely in commercial quantities. The market for Wyoming soda sh is extensive and Wyoming is a supplier of soda ash throughout the world. Currently, five underground mines are producing trona and one underground mine will soon be constructed.

Presently, there are 54 Federal sodium leases within the Green River Basin (GRB). These federal leases encompass 75,783 acres and contain approximately two billion tons of recoverable trona.

Federal sodium leases are initially issued for a 20 year period and may be renewed at the discretion of the authorized officer for 10-year periods. The last competitive sodium lease sale of public land in southwest Wyoming occurred in September 1986. The Secretary of the Interior is responsible for obtaining fair market value for sodium leases.

RELATIONSHIP TO LAND USE PLANS AND OTHER ENVIRONMENTAL DOCUMENTS

Sodium Mineral Development Environmental Assessment (1981) and Revised Decision Record (1983) - The proposed lease sale lands lie in the Kemmerer Resource Area and the Green River Resource Area of the Bureau of Land Management Rock Springs District. The proposed lease tracts are within the KSLA as defined by the Bureau of Land Management in the Sodium Mineral Development EA/DR (see Map 1-2). The surface occupancy criteria and mitigating measures contained in the Sodium Mineral Development Environmental Assessment Decision Record will be applied as applicable on a case-by-case basis. Leases will be conditioned to ensure that unacceptable adverse impacts to other resources are minimized.

Kemmerer Resource Management Plan Environmental Impact Statement and Record of Decision (1986) - The Kemmerer Resource Management Plan (RMP) also covers the proposed lands. The RMP states that all unleased public lands within the KSLA are available for leasing consideration.

Ashley National Forest Land and Resource Management Plan, EIS and Record of Decision (1986) - The Flaming Gorge National Recreation Area is covered by the Ashley National Forest Land and Resource management Plan and EIS. The Forest Plan prescribes management direction for lands contained within the National Recreation Area.

Green River Resource Management Plan and Draft Environmental Impact Statement (1992) - The Green River Resource Area RMP and Draft Environmental Impact Statement (DEIS) covers the eastern part of the proposed leasing area. The RMP/DEIS is in draft form and is available for public review. The RMP/DEIS specifies the objective for management of the federal sodium resource as to provide for both short-and long-range development in an orderly and timely manner. The KSLA would remain open to exploration, leasing and development.

Use Authorization - Any lease development will be covered by permits from the Wyoming Department of Environmental Quality Land Quality Division, Air Quality Division, Water Quality Division, and Industrial Siting Council. In addition, permits from the Wyoming Department of Transportation, Sweetwater County Board of County Commissioners, U.S. Army Corps of Engineers, and the Wyoming State Engineer may be required. BLM use authorizations (i.e., leases, rights-of-way, permits, etc.) for processing plant facilities, roads, powerlines, pipelines, and rail spurs will be processed through the usual application permitting process.

Lease Stipulations - The 65 mitigating measures outlined in the Revised Decision for the Sodium Mineral Development EA include special stipulations on occupancy and are in addition to the standard federal lease terms. These stipulations are designed to protect surface resources such as visually sensitive areas, soils, vegetation, water, and wildlife by restricting periods of activity and areas of disturbance.

COMPLIANCE WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

Sodium leasing is subject to an appropriate level of environmental analysis in accordance with the National Environmental Policy Act (NEPA). The appropriate level (Environmental Assessment or Environmental Impact Statement) will be determined by the BLM following receipt and review of comments on this Scoping Notice.

The environmental analysis that will be prepared will incorporate appropriate discussions and analysis from the Kemmerer, Green River and National Recreation Area Land Use Plans and the Sodium Mineral Development EA.

In accordance with 40 CFR 1506.2(a) & (c), to reduce duplication to the fullest extent possible, other federal, state and local agencies which have jurisdiction by law or special expertise, will be informed and invited to provide input and cooperate in the preparation of the environmental analysis. State agencies anticipated to be involved include: the Department of Environmental Quality - Water Quality Division, Air Quality Division, Industrial Siting Administration, and State Engineer. Federal Agencies anticipated to be involved include: the Forest Service, Fish and Wildlife Service, Army Corps of Engineers, Bureau of Mines, and Bureau of Reclamation.

IDENTIFIED LAND AND RESOURCE MANAGEMENT ISSUES/CONCERNS

The following list of issues and concerns is based on scoping and public comment/input provided for the Sodium Mineral Development EA, the Kemmerer Resource Management Plan EIS, the Green River Resource Area Resource Management Plan DEIS, and the Flaming Gorge National Recreation Area Forest Plan EIS.

The list of issues and concerns may not be complete since the planning efforts encompassed a much larger area (i.e., parts of Lincoln, Uinta, and Sweetwater Counties) and did not relate specifically to the proposed leasing area.

However, the following list is intended as a starting point from which to identify other resource issues and concerns specific to the proposal area that must be evaluated through the NEPA process.

Known land and resource management issues that will be analyzed in the environmental analysis are:

- Candidate and threatened and endangered species (plant and animal).
- Antelope crucial winter range, sage grouse/raptor breeding and nesting habitat.
- Steep slopes, unstable highly erodible soils and reclamation difficulty.
- Perennial streams - Blacks Fork River and Green River.
- Cultural resources.
- Surface and ground water resources.
- Wetland/riparian and floodplain area protection pursuant to Executive Orders 11990 and 11988.
- High and moderate visual resource sensitivity.
- Increased human activity.
- Social and economic affects to the local communities.
- Cumulative impacts.
- O/G and sodium development issues.

An Interdisciplinary Team (IDT) of resource specialists will be involved in the analysis of the environmental impacts of the proposed action. This will include a terrestrial wildlife biologist, surface and groundwater hydrologist, soils/reclamation specialist, geologist, botanist, air quality specialist, and mining engineer. The need for other team specialists or the deletion of any of the proposed specialists will be decided based upon final review of public, state, and other federal agency response to this scoping statement.

SCHEDULE FOR PUBLIC INPUT

The public is encouraged to participate throughout the environmental analysis process. This process is scheduled to be completed in November 1994. The public should submit comments on this scoping statement by the date specified in the cover letter.

PUBLIC PARTICIPATION

Scoping Notice Initial Mailing Distribution:

Government Offices:

- Bureau of Land Management, Wyoming State Office (910, 912, 920, 934)
- Bureau of Reclamation
- Environmental Protection Agency
- U.S. Forest Service, Ashley National Forest
- U.S. Forest Service, Ashley National Forest, Flaming Gorge Ranger District
- U.S. Fish and Wildlife Service
- U.S. Department of the Army, Corps of Engineers
- Wyoming State Clearinghouse
- Wyoming Department of Environmental Quality
- Wyoming Oil and Gas Conservation Commission
- Wyoming Game and Fish Department (Cheyenne, Green River)

Elected Officials:

- Governor of Wyoming
- Lincoln County Commissioners
- Lincoln County Planning Commission
- Lincoln County Library
- Mayor of Green River
- Mayor of Rock Springs
- State Senator Frank Prevedel, District 12
- State Senator Carl Maldonado, District 13
- State Senator Mark O. Harris, District 14
- State Representative Sam Blackwell, District 16
- State Representative Ray Sarcletti, District 17
- State Representative Elwin McGrew, District 18
- State Representative Chris Boswell, District 39
- State Representative Bud Nelson, District 48
- State Representative Louise Ryckman, District 60
- Sweetwater County Commissioners
- Sweetwater County Planning Commission
- Sweetwater County Library
- Uinta County Commissioners
- Uinta County Planning Commission
- Uinta County Library
- U.S. Senator Malcolm Wallop, Becky Costantino, Representative
- U.S. Senator Alan K. Simpson, Lyn Shanaghy, Representative
- U.S. Congressman Craig Thomas, Pati Smith, Representative

Public Land Users and User Groups:

- Church & Dwight
- FMC Corp.
- General Chemical
- National Grazing Association
- Northwest Pipeline Company

Olin
Oregon-California Trail Association
Oxidental Chemical
Petroleum Association of Wyoming
Placer Dome
Questar Pipeline Company
Rhone Poulenc
Rocky Mountain Oil and Gas Association (RMOGA)
Shoshone-Arapahoe Joint Tribal Council
Sierra Club, Northern Plains Representative
Solvay Minerals
Southwest Economic Development Association
Southwest Wyoming Industrial Association
Simons, Gene
Sweetwater Wildlife Association
Texas Gulf Soda Ash, Inc.
Union Pacific Resources Company
US Borax
Wexpro/Celcius Company
Wilderness Society
Wildlife Federation
Wyoming Association of Professional Archaeologists
Wyoming Mining Association
Wyoming Outdoor Council
Wyoming Public Lands Council

Livestock Permittees:

Aimone, Martin
Austin, Ira A.
Big Sandy and Green River Livestock Co.
Blair and Hay Land and Livestock Co.
Bonomo, Elmer J.
Brodbent, J.R.
Cedar Creek Ranch
Chilton Land and Livestock
Eversole, Elza
Gamble, Earl
Gamble, Robert
Hofeldt, John W.
Mud Springs Livestock
Pal, Signe C.
Power, Vic
Ramsay, James W.
Rock Springs Grazing Association
Thoman, William J.
Tripp, William H.
Vercimak, Don A.
Vercimak, Peggy J.
Weber Estate
Wilde, Reed

Newspapers:

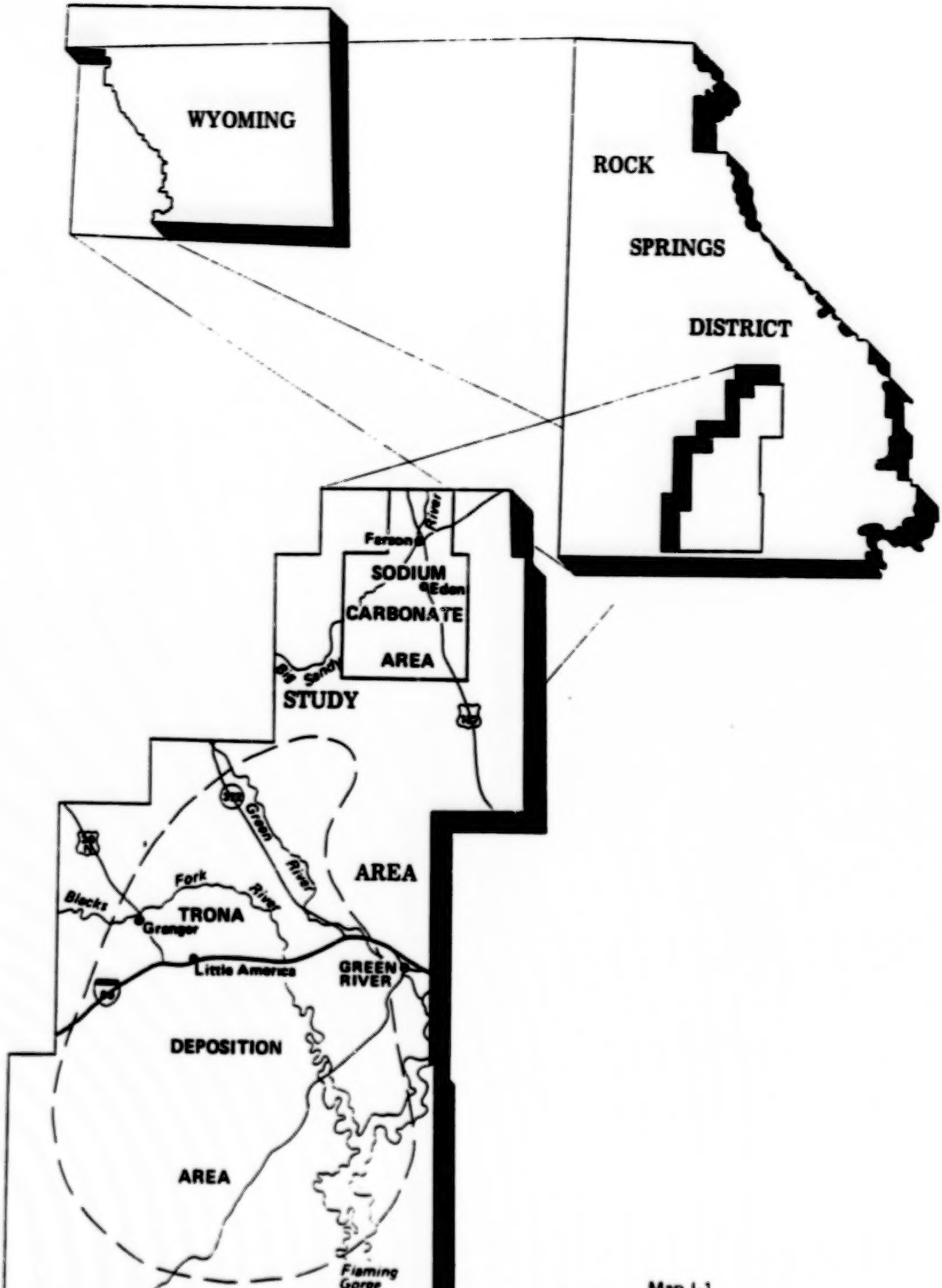
- Kemmerer Gazette
- Rock Springs Daily Rocket-Miner
- Casper Star-Tribune
- Green River Star
- Wyoming State Journal
- Uinta County Herald
- Bridger Valley Pioneer

Radio Stations:

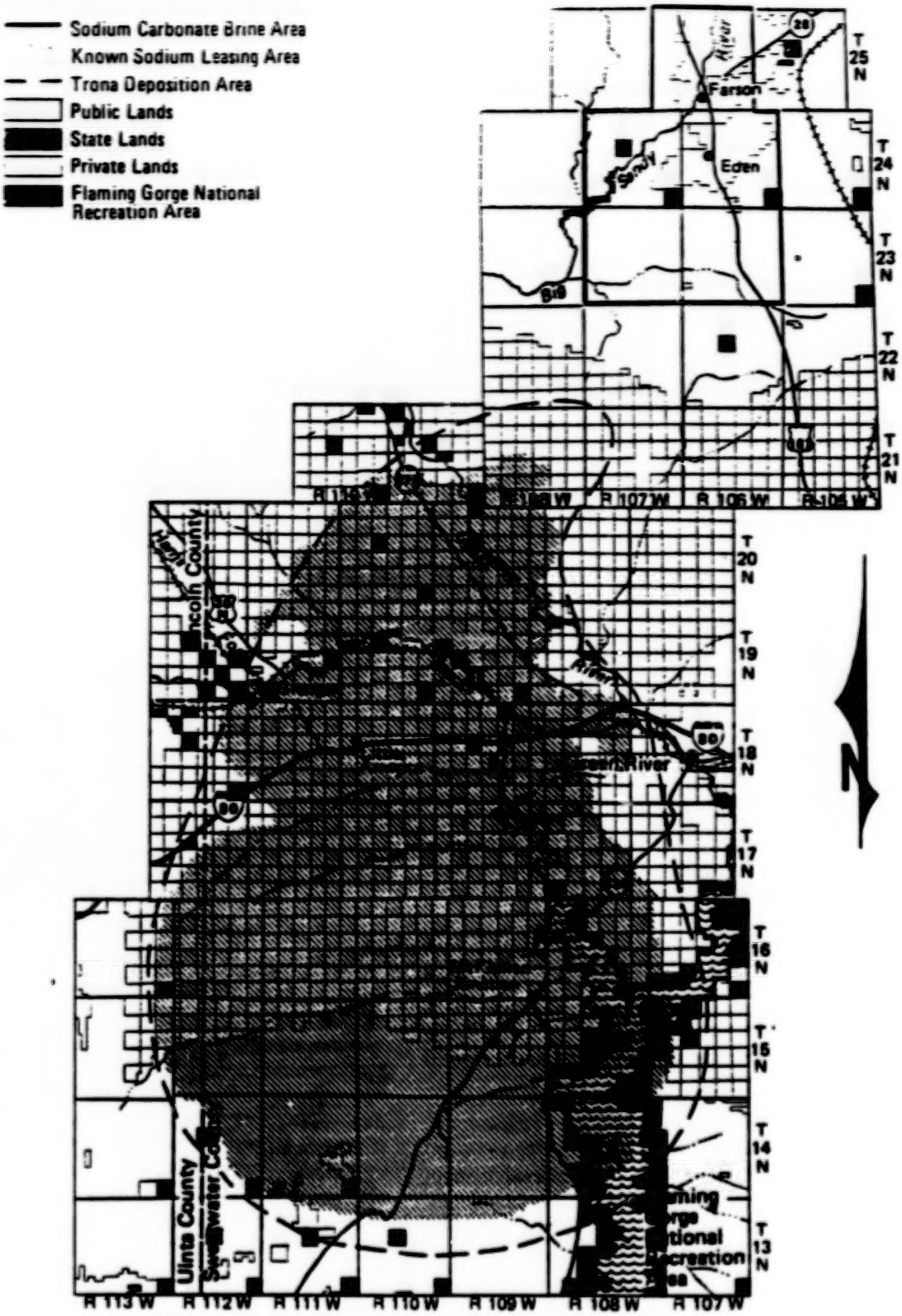
- KRSV - Afton
- KQSW/KRKK - Rock Springs
- KSIT - Rock Springs
- KUGR - Green River
- KYCS - Rock Springs
- KMER - Kemmerer
- KEVA/KOTB - Evanston

Television Stations:

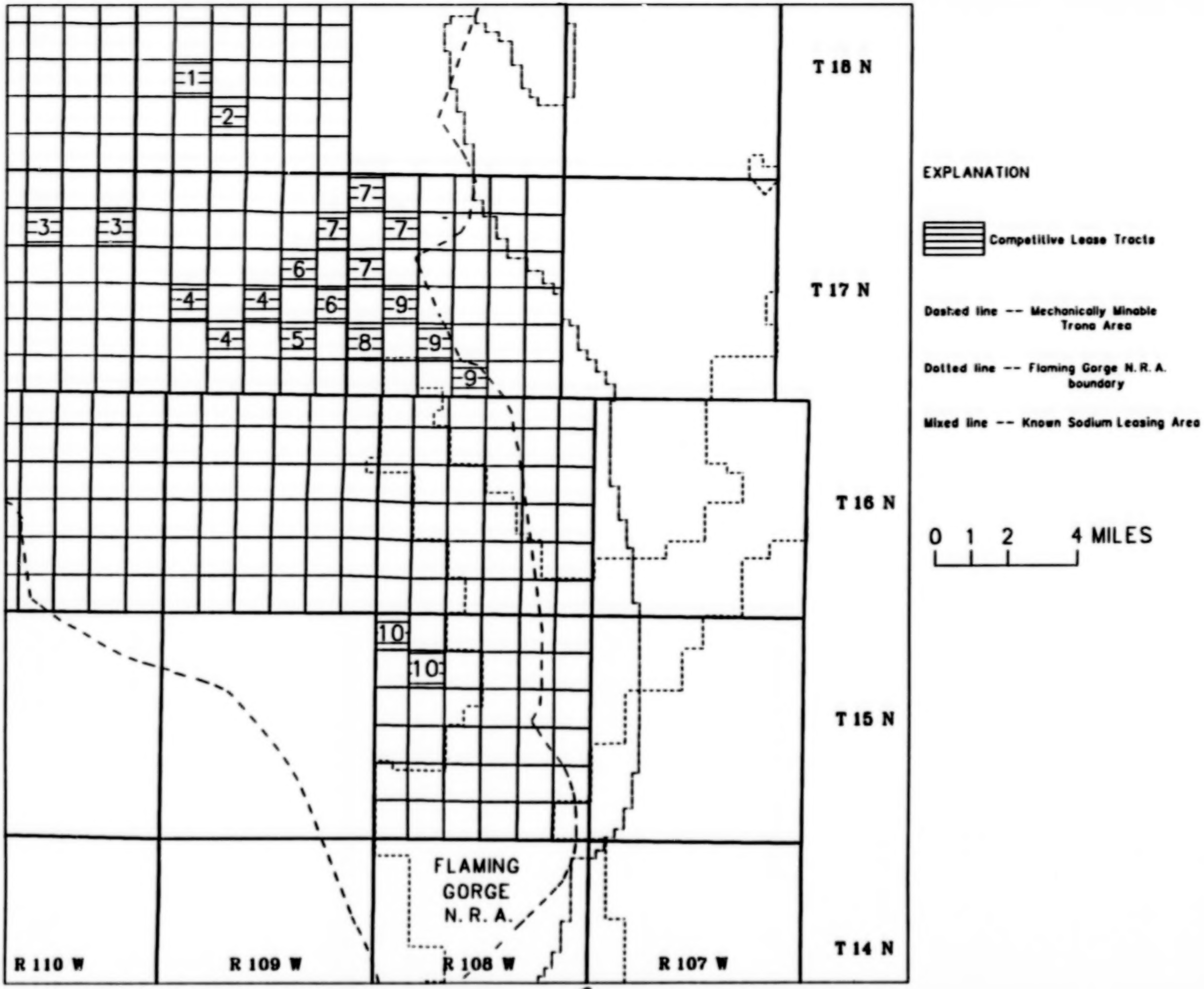
- KTWO-TV - Casper
- KCMY-TV - Casper
- Sweetwater Television



Map I-1
GENERAL LOCATION MAP



Map I-2
LAND STATUS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R 109 W
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FLAMING GORGE N. R. A.
EXPLANATION
Competitive Lease Tracts
Dashed line -- Mechanically Minable Trona Area
Dotted line -- Flaming Gorge N. R. A. boundary
Mixed line -- Known Sodium Leasing Area
0 1 2 4 MILES

SCOPING COMMENT SUMMARY

NAME	COMMENTS
Tg Soda Ash, Inc., Roger Harris	Keep informed.
Kenneth Reim	Further development by additional operators will increase: competition, reduce cost of sodium containing products, increase exports, and reduce foreign balance of trade and should be addressed in EA.
	Compliance with Mining and Minerals Policy Act of 1970 (PL 91-631), and National Materials and Mineral Policy, Research and Development Act of 1980 (PL 479) should also be listed.
Rhone Poulenc, M.L. Andrews	Keep informed.
WY Division of Parks & Cultural Resources, John Keck	Protection of cultural resources is in accordance with Sec. 106 and 36 CFR 800. Survey, evaluation, and protection of significant sites must be done prior to surface disturbance. SHPO control number is 0994KLK049.
WY Public Service Commission, Donald Roberts	No unreasonable restrictions should be placed on utility service authorizations/construction activities. **Costs of relocating utility and pipeline facilities should be borne by the lessee if development of sodium occurs** (added as a stipulation under the Proposed Action).
US Corps of Engineers, Matthew Bilodeau	Should waters of the US be affected by any activity, the lessee will be required to obtain a Sec. 404 permit.
WDEQ, Philip Ogle	Surface, ground water resources, and wetland/riparian/floodplain areas are known concerns, keep Water Quality Division informed during process.
UP Minerals, Inc., R.A. See	Keep identified divisions informed. Question rationale of offering 20 sections covering a broad area for lease at this time in view of BLM's concern over the issue of "due diligence." No specific comment until BLM identifies a "due diligence" approach.
	Sections 20, 22, & 28 (T. 17 N., R. 109 W.) are proposed under Lease Tract 4. Church & Dwight has leases in sections 16, 17, 18, 19, 21, 29, 30, 31, 32, 33, and 34 (T. 17 N., R. 109 W.). Consideration should be given to offering sec 22 (T. 17 N., R. 109 W.) separately, or with other sections.

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NAME	COMMENTS
	Sec. 12 (T. 17 N., R. 109 W.) is less than 640 acres. Mistake made describing acreage as 563.10 acres when it actually is 361.11 acres. Since section 12 has privately owned interests, it should be a separate tract.
	Previous input from companies at BLM's request for identification of tracts was not followed except in one case. Thus, the sale tracts are configured in a manner that could impede logical mining units.
US Corps of Engineers, Robert Nebel	Level of involvement depends on whether 404 permits are needed. Recommend consultation with SHPO.
WY State Geological Survey, Gary Glass	No additional resource concerns. Have concerns that involve oil/gas - trona resource conflicts, slope stability, erodible soils, protection of ground water. Preparing new maps of surficial geology which may interest BLM.
Church & Dwight Co, Inc., Mark Conish	Keep informed.
Petroleum & Mineral Projects, Eugene Simons	Per comments on Wold project, objected to inclusion of lands previously designated as "selected" in long- standing exchange proposal. This proposal includes some of the same sections.
	Sections 6 & 8 (T. 15 N., R. 108 W.) are the only sections. in the general area that have been nominated. They don't adjoin other federal lands under lease and are not required by any trona mining operations to provide additional reserves. Also, they don't support the formation of logical mining units but were included to establish a "beach-head" on favorable reserves in the area and would be a device for breaking the logical mining unit that he has proposed and includes part of my "preference right" leases.
	BLM has a long-standing agreement (1979) to consider the exchange proposal when the right to the "preference right" leases were acquired. These rights were affirmed by final IBLA decision on 12/20/94 (IBLA 91-149). BLM has since delayed progress on the basis that a "Motion for Reconsideration" has been filed allowing suspension of the exchange process until IBLA decides on the motion (letter from WSD, 1/26/94; meeting on 3/2/94).

NAME	COMMENTS
	43 CFR 4.403 states in part that the filing of pendency, or denial, of a "Motion for Reconsideration" shall not operate to state the effectiveness or affect the finality of the decision involved unless so ordered by the Board. The Board has not so ordered.
	The inclusion of isolated sections 6 & 8 (T. 15 N., R. 108 W.) in this competitive leasing would breach the agency's agreement to consider the exchange proposal.
Petroleum Association of WY, Thomas Clayson	Questions the rationale of issuing 20 sections of new sodium leases at this time. Not consistent with current BLM policy which PAW understands to be a ban on leasing o/g resources within KSLA until a policy is implemented on simultaneous development. Concern over lack of interest from trona operators on their immediate need for these tracts.
	Simultaneous development issues are far from being resolved. Until BLM finalizes simultaneous development policy, it appears that sodium producers may secure an unjust advantage of o/g resources if the proposed sodium leasing is completed.
	BLM should analyze effects of sodium leasing in conjunction with a potential BLM policy that would include a "first in time - first in right" on the o/g industry. Will sodium leasing result in trona operators gaining access to the resource while forcing o/g operators to not consider leasing the same lands? What will the effects of not leasing o/g reserves on royalties, ad valorem, severance taxes to federal, state, and local entities. Is o/g industry being singled-out for more restrictive treatment?
	What are the consequences to those currently mining or proposing to mine sodium if BLM refrains from offering leases until BLM, UPRC, and WY complete on-going efforts towards establishing a co-development policy?
	PAW has opposed contingent rights stipulations. Will BLM consider a stipulation to sodium leases requiring terms to be amended to recognize BLM's future co-development policy?
	Believe it's not in the best interest to anyone to proceed with sodium leasing at this time. Potential for lost o/g exploration, development, and the economic benefits may be potentially too great to ignore. Proceeding with leasing may cause additional or intensify ongoing simultaneous development conflicts. How will the trona industry or US benefit from leasing at this time?

NAME	COMMENTS
UPRC, David Petrie	UPRC has been participating in the JIC; working to resolve issues surrounding concurrent development of trona-o/g. Analysis on sodium should address concurrent development of trona-o/g and be subject to the final findings of JIC. Keep informed.
FMC, John Corra	Keep informed. Must assume that the entities who obtain control of the 10 tracts will develop and market sodium products. It's probable that 1 or 2 new producers could enter the market. Such an event could have impacts on existing trona producers and would require analysis. BLM should examine the alternative to leasing only a subset of the 10 tracts. A logical subset, which may have fewer or less significant impacts, are the tracts near sections controlled by existing trona producers.
	BLM should identify and consider alternatives to the proposed lease including: no action, reduced acreage, and mitigation measures not in the proposed action. Since BLM determined that development of trona is appropriate land use, not having a competitive sale is an inappropriate alternative. Leasing less than 10 tracts or different tracts are options that should be considered.
	At least 1 or 2 new trona developments could occur if proposed action is implemented. BLM must balance the contribution of new producers with possible offsets created by such expansion. Currently, supply exceeds demand. BLM must also address the cumulative impacts which would be consistent with BLM's objective to make sodium available in an orderly, timely manner to meet national and export needs; promote healthy competition w/in industry; and assure fair return to the public (Sodium EA 1981). Additionally, the decision of whether to proceed with the competitive sale as proposed or an alternative proposal must be considered.
	BLM needs to consider alternative leasing possibilities, decision to approve the Wold project, and impacts development would have on existing trona producers.
Sweetwater County, Mark Kot	Zone change to Mineral Development I or II is advised for all areas considered in the lease prior to development. This will help the county to gather public input to assess special needs created by the sale of these tracts. If mine development occurs, proper construction/use permits are required.

NAME	COMMENTS
	Planning Dept seeks to assure that potential development occurs in a manner that minimizes and mitigates impact to natural assets like Flaming Gorge NRA, Blacks Fork River, Green River, and all historic trails.
	Coordinate all road construction/access with county. County supports and encourages sodium mineral leasing program.
National Wildlife Federation, Susan Horner	BLM used wrong name (see letter for proper name/address). Any sodium leasing activity must be considered in conjunction with the cumulative impacts from other mineral development in the area, particularly o/g. The NEPA document must reflect the fact that there is extensive existing and proposed mineral development in the area. No document exists addressing this concern. Therefore any document prepared which fails to address cumulative impacts adequately and provide mitigation will be inadequate.
US BORAX, Robert Munro	Supports proposal and is pleased the moratorium is ending on leasing trona which has been a disservice to the US public. Although royalty and trona-o/g development conflict needs to be resolved, neither has significant bearing on the NEPA analysis for the proposed sale. Industry interest in leasing is high. Keep informed.
	NEPA analysis must include direct and indirect impacts or actions that could have a significant cumulative environmental impacts; address Wold decision. Wold project should not add significantly to cumulative impacts.
	Must address the no action alternative, reasonable alternatives, and mitigation measures not in the proposed action. No need for detailed no action alternative analysis. Other alternatives would identify different lease tracts, reduction of acreage (would not meet BLM objectives and would lessen industry interest).
	Our Expression of Corporate Interest document filed w/BLM, the tracts specified are believed to contain minable sodium compounds. BLM must identify these alternatives but detailed consideration is not warranted; nor should BLM provide detailed analysis of mitigation measures beyond those identified in the Sodium Mineral Development DR or the standard sodium lease.

NAME	COMMENTS
	NEPA process should be limited to identification and consideration of only those impacts related to the proposed lease sale. The scope of the document should not extend to identification and consideration of actual lease development since further site-specific analysis would be required. Thus, the leasing stage is where BLM should determine whether additional mitigation measures are required for a particular development activity. The analysis should fully consider relevant mitigation measures and surface occupancy criteria identified in existing RMP/MFPs and leases.
	BLM should identify and eliminate insignificant issues from consideration. A substantial portion of NEPA analysis has been performed by adopting RMP/MFP, Sodium DR and the Proposed Sodium Lease Sale in 12/92. Relying of these documents and a concentrated focus on new issues of environmental significance will conserve gov. resources and fulfill both gov. and industry's goal to implement a valid lease sale as quickly as possible. Additionally, impact of competitive leasing w/in the KSLA have been previously analyzed in KRMP/EIS, GRRMP/DEIS, Sodium Mineral Development EA/DR, Revised DR, and the Sodium Mineral Lease Sale EA, FONSI, DR. This analysis should be tiered to the previous ones but needs to be updated so not to render present analysis inadequate and vulnerable to a legal challenge.
	Supplementing existing programmatic analyses with this analysis, BLM must identify the affected environment and consequences w/sufficient specificity to allow an informed decision. Issues of probable concern include: antelope crucial winter range, air quality, water quality, T/E/C species, sage grouse strutting grounds and breeding habitat, raptor, vegetation, livestock grazing, recreation (Blacks Fork River), soils, socioeconomics, visual, health and safety, transportation, conflict with o/g development, and unauthorized removal of mineral materials. Impacts are not expected to be significant.
	Those resources not expected to be impacted include: ACECs, farmlands, access/scenic byways, wild/scenic rivers, wilderness/WSA, Native American religious concerns, wetlands, floodplains, historic trails, domestic lambing areas, and fisheries.
	US BORAX encourages BLM to complete the analysis by 12/1/94. If new issues are identified then BLM must take reasonable time to fully address those issues so it won't be vulnerable to legal challenge.

NAME	COMMENTS
	These comments may be supplemented as new information becomes available. Keep informed and allow for involvement.
WGFD, John Talbott	Terrestrial Considerations - Much of the area is crucial winter range/yearlong range for antelope. Distribution maps have been updated and should be used for this analysis. Mule deer (Uinta Herd Unit) occupy Blacks Fork and adjacent areas yearlong. Sage grouse leks are in the area. Blacks Fork riparian areas serve as brood rearing habitat. Waterfowl - Canada geese, nest along the Blacks Fork. F. hawks, g. eagles, red-tail hawks, and burrowing owls occupy the area; prairie dogs are also present. In order to conduct a satisfactory analysis under NEPA, the following wildlife information must be collected (see items a-f for specific comments): surveys for raptors, sage grouse leks (old/new), prairie dog, black-footed ferret, wetlands/riparian, big winter game utilization patterns, and WY state priority 1 bird and mammal species and migratory bird species of high federal interest that may occur in the area. Letter goes on to cite regulations on purpose, methodology, and scientific accuracy, and incomplete and unavailable information.
	Analysis must disclose impacts to: a thorough description of facilities as related to important wildlife areas, including human activity, noise, and dust, etc.; impacts to raptor habitat, sage grouse habitat, big game crucial winter habitat and migration areas, T/E/C species, migratory bird habitat, and state priority 1 birds; wetlands, riparian zones, rimrocks; poaching, harassment, vehicular access.
	BLM must complete a cumulative impact assessment of mineral development in Southwest Wyoming before further leasing is permitted. See regulations 40 CFR 1502.16, 1508.8, 1508.7, 1508.27.

NAME	COMMENTS
	WY Game and Fish Commission categorizes crucial winter range as vital - directly limits a community, population, or subpopulation, and restoration or replacement may not be possible. WGFD is directed by the commission to recommend no loss of habitat function (arrangement of features, and capability of those features to sustain species, populations, and diversity of wildlife over time). The WGFD recommends avoidance of direct surface disturbance within crucial winter habitat to the maximum extent possible. If disturbance is unavoidable, replacement of affected habitat or enhancement of similar habitat within the same crucial winter habitat complex. Mitigation can include: restoring/rehab of previously altered habitat within crucial range complex; enhancing similar, nearby habitat; or combination of both. Specific mit measures to offset habitat losses associated with project should be addressed in the analysis.
	Aquatic Considerations - Depending upon development, activities could affect fishery resources in the Blacks Fork and Flaming Gorge Reservoir. Blacks Fork supports large number of native fish and channel catfish when water is present. Flaming Gorge is an important fishery; populations of small-mouth bass, channel catfish, and rainbow, brown, and lake trout in Halfway Hollow area. This part of the reservoir is an important spawning and nursery area for native and naturalized game and nongame fish species.
	Should development occur, WGFD is concerned with increases of sediments and other pollutants into Blacks Fork River and Flaming Gorge. Degradation of water quality in these habitats can be detrimental to fish growth and survival. Also, potential discharges associated with refining and erosion in dry washes is a concern. No objections to underground activities including under the Green River/Blacks Fork.
	Recommend no tract development in tracts 7, 8, 9, or 10. Surface development and related sediment contributions to the Blacks Fork and Flaming Gorge Reservoir are also a concern in tracts 1-5; specific measures should be implemented to minimize potential water quality and fishery impacts.
Sierra Club-NGPR, Liz Howell	Concern of protecting aesthetics, air quality, and recreational experiences in the Devil's Playground WSA. To protect the WSA, the Club recommends a 4-mile buffer zone between leasing and WSA boundary.

NAME	COMMENTS
	Flaming Gorge NRA is recognized for recreational opportunities, archaeological and paleontological artifacts. A complete analysis by geologists, archaeologists, and paleontologists would assure protection of these resources.
	Impacts of sodium leasing are obviously significant. A full environmental impact statement needs to be prepared. Additionally, the Club is concerned about impacts to wildlife and wants these impacts analyzed in the NEPA document.

APPENDICES

APPENDIX A

STANDARD LEASE STIPULATIONS

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

______________________ LEASE

Serial Number

PART I. LEASE RIGHTS GRANTED.

This ☐ Lease ☐ Lease Renewal entered into by and between the UNITED STATES OF AMERICA, through the Bureau of Land Management, hereinafter called lessor, and *(Name and Address)*

hereinafter called lessee, is effective *(date)* , for a period of years,

Sodium, Sulphur, Hardrock –

☐ with preferential right in the lessee to renew for successive periods of years under such terms and conditions as may be prescribed by the Secretary of the Interior, unless otherwise provided by law at the expiration of any period.

Potassium, Phosphate, Gilsonite –

☐ and for so long thereafter as lessee complies with the terms and conditions of this lease which are subject to readjustment at the end of each year period, unless otherwise provided by law.

Sec. 1. This lease is issued pursuant and subject to the terms and provisions of the:

☐ Mineral Leasing Act of 1920, as amended, and supplemented, 41 Stat. 437, 30 U.S.C. 181–287, hereinafter referred to as the Act;

☐ Mineral Leasing Act for Acquired Lands, Act of August 7, 1947, 61 Stat. 913, 30 U.S.C. 351–359;

☐ Reorganization Plan No. 3 of 1946, 60 Stat. 1099 and 43 U.S.C. 1201;

☐ *(Other)* ; and

to the regulations and general mining orders of the Secretary of the Interior in force on the date this lease issued.

Sec. 2. Lessor, in consideration of any bonuses, rents, and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants and leases to lessee the exclusive right and privilege to explore for, drill for, mine, extract, remove, beneficiate, concentrate, or otherwise process and dispose of the deposits hereinafter referred to as "leased deposits," in, upon, or under the following described lands:

containing acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and the right to use such on-lease rights-of-way which may be necessary and convenient in the exercise of the rights and privileges granted, subject to the conditions herein provided.

Phosphate –

☐ In accordance with Section 11 of the Act (30 U.S.C. 213), lessee may use deposits of silica, limestone, or other rock in the processing or refining of the phosphates, phosphate rock, and associated or related minerals mined from the leased lands or other lands upon payments of royalty as set forth on the attachment to this lease. *(Phosphate leases only.)*

PART II. TERMS AND CONDITIONS

Sec. 1. (a) RENTAL RATE – Lessee shall pay lessor rental annually and in advance for each acre or fraction thereof during the continuance of the lease at the rate indicated below:

Sulphur, Gilsonite –

☐ 50 cents for the first lease year and each succeeding lease year;

Hardrock –

☐ $1 for the first lease year and $1 for each succeeding lease year;

Phosphate –

☐ 25 cents for the first lease year, 50 cents for the second and third lease years, and $1 for each and every lease year thereafter;

Potassium, Sodium –

☐ 25 cents for the first calendar year or fraction thereof, 50 cents for the second, third, fourth, and fifth calendar years respectively, and $1 for the sixth and each succeeding calendar year; or

Sodium, Sulphur, Asphalt, and Hardrock Renewal Leases –

☐ $ for each lease year;

(b) RENTAL CREDITS – The rental for any year will be credited against the first royalties as they accrue under the lease during the year for which rental was paid.

Sec. 2. (a) PRODUCTION ROYALTIES – Lessee shall pay lessor a production royalty in accordance with the attached schedule. Such production royalty is due the last day of the month next following the month in which the minerals are sold or removed from the leased lands.

(b) MINIMUM ANNUAL PRODUCTION AND MINIMUM ROYALTY – (1) Lessee shall produce on an annual basis a minimum amount of , except when production is interrupted by strikes, the elements, or casualties not attributable to the lessee. Lessor may permit suspension of operations under the lease when marketing conditions are such that the lease cannot be operated except at a loss. (2) At the request of the lessee, made prior to initiation of the lease year, the authorized officer may allow in writing the payment of a $3.00 per acre or fraction thereof minimum royalty in lieu of production for any particular lease year. Minimum royalty payments shall be credited to production royalties for that year.

Sec. 3. REDUCTION AND SUSPENSION – In accordance with Section 39 of the Mineral Leasing Act, 30 U.S.C. 209, the lessor reserves the authority to waive, suspend or reduce rental or minimum royalty, or to reduce royalty, and reserves the authority to assent to or order the suspension of this lease.

Sec. 4. BONDS – Lessee shall maintain in the proper office a lease bond in the amount of $, or in lieu thereof, an acceptable statewide or nationwide bond. The authorized officer may require an increase in this amount when additional coverage is determined appropriate.

Sec. 5. DOCUMENTS, EVIDENCE AND INSPECTION – At such times and in such form as lessor may prescribe, lessee shall furnish detailed statements showing the amounts and quality of all products removed and sold from the lease, the proceeds therefrom, and the amount used for production purposes or unavoidably lost.

Lessee shall keep open at all reasonable times for the inspection of any duly authorized officer of lessor, the leased premises and all surface and underground improvements, work, machinery, ore stockpiles, equipment, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or under the leased lands.

Lessee shall either submit or provide lessor access to and copying of documents reasonably necessary to verify lessee compliance with terms and conditions of the lease.

While this lease remains in effect, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 6. DAMAGES TO PROPERTY AND CONDUCT OF OPERATIONS – Lessee shall exercise reasonable diligence, skill, and care in the operation of the property, and carry on all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health or property, and of waste or damage to any water or mineral deposits.

Lessee shall not conduct exploration or operations, other than casual use, prior to receipt of necessary permits or approval of plans of operations by lessor.

Lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations, and the approved mining plans in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, minerals, and other resources, and to other land uses or users. Lessee shall take measures deemed necessary by lessor to accomplish the intent of this lease term. Such measures may include, but are not limited to, modification to proposed siting or design of facilities, timing of operations, and specification of interim and final reclamation procedures.

Lessor reserves to itself the right to lease, sell, or otherwise dispose of the surface or other mineral deposits in the lands and the right to continue existing uses and to authorize future uses upon or in the leased lands, including issuing leases for mineral deposits not covered hereunder or the approval of easements or rights-of-way. Lessor shall condition such uses to prevent unnecessary or unreasonable interference with rights of lessee as may be consistent with concepts of multiple use and multiple mineral development.

Sec. 7. PROTECTION OF DIVERSE INTERESTS, AND EQUAL OPPORTUNITY – Lessee shall: pay when due all taxes legally assessed and levied under the laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; restrict the workday to not more than 8 hours in any one day for underground workers, except in emergencies; and take measures necessary to protect the health and safety of the public. No person under the age of 16 years shall be employed in any mine below the surface. To the extent that laws of the State in which the lands are situated are more restrictive than the provisions in this paragraph, then the State laws apply.

Lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor. Neither lessee nor lessee's subcontractors shall maintain segregated facilities.

Sec 8. (a) TRANSFERS – This lease may be transferred in whole or in part to any person, association or corporation qualified to hold such lease interest.

(b) RELINQUISHMENT – The lessee may relinquish in writing at any time all rights under this lease or any portion thereof as provided in the regulations. Upon lessor's acceptance of the relinquishment, lessee shall be relieved of all future obligations under the lease or the relinquished portion thereof, whichever is applicable.

Sec. 9. DELIVERY OF PREMISES, REMOVAL OF MACHINERY, EQUIPMENT, ETC. – At such time as all or portions of this lease are returned to lessor, lessee shall deliver up to lessor the land leased, underground timbering, and such other supports and structures necessary for the preservation of the mine workings on the leased premises or deposits and place all wells in condition for suspension or abandonment. Within 180 days thereof, lessee shall remove from the premises all other structures, machinery, equipment, tools, and materials that it elects to or as required by the authorized officer. Any such structures, machinery, equipment, tools, and materials remaining on the leased lands beyond 180 days, or approved extension thereof, shall become the property of the lessor, but lessee shall either remove any or all such property or shall continue to be liable for the cost of removal and disposal in the amount actually incurred by the lessor. If the surface is owned by third parties, lessor shall waive the requirement for removal, provided the third parties do not object to such waiver. Lessee shall, prior to the termination of bond liability or at any other time when required and in accordance with all applicable laws and regulations, reclaim all lands the surface of which has been disturbed, dispose of all debris or solid waste, repair the offsite and onsite damage caused by lessee's activity or activities on the leased lands, and reclaim access roads or trails.

Sec. 10. PROCEEDINGS IN CASE OF DEFAULT – If lessee fails to comply with applicable laws, now existing regulations, or the terms, conditions and stipulations of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation by the lessor only by judicial proceedings. This provision shall not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occuring at any other time.

Sec. 11. HEIRS AND SUCCESSORS-IN-INTEREST – Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

Sec. 12. INDEMNIFICATION – Lessee shall indemnify and hold harmless the United States from any and all claims arising out of the lessee's activities and operations under this lease.

Sec. 13. SPECIAL STATUTES – This lease is subject to the Federal Water Pollution Control Act (33 U.S.C. 1151–1175), the Clean Air Act (42 U.S.C. 1857 et. seq.), and to all other applicable laws pertaining to exploration activities, mining operations and reclamation.

Sec. 14. SPECIAL STIPULATIONS –

(Section 14 continued on reverse)

Sec. 14. SPECIAL STIPULATIONS – (Cont.)

	THE UNITED STATES OF AMERICA
Company or Lessee Name	By
(Signature of Lessee)	*(Signing Officer)*
(Title)	*(Title)*
(Date)	*(Date)*

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

NOTICE

The Privacy Act of 1974 and the regulations in 43 CFR 2.48(d) provides that you be furnished the following information in connection with information required under the terms of this lease.

AUTHORITY: **30 U.S.C. 181 et seq.; 43 CFR 3500.**

PRINCIPAL PURPOSE: **The information will be used to verify your compliance with the lease terms and in calculating royalty payments.**

ROUTINE USES: **(1) Evaluation of the effects of the operations on the environment. (2) Statistical reports to Congress. (3)(4) and (5) Information from the record and/or the record may be released or transferred to appropriate Federal, State or local agencies in allocating mineral revenue, for investigations of energy programs; and when relevant to civil, criminal or regulatory investigations or prosecutions, as well as routine regulatory responsibility.**

EFFECT OF NOT PROVIDING INFORMATION: **Disclosure of this information is mandatory only if the lessee elects to mine, extract, remove and/or dispose of the leased deposits.**

The Paperwork Reduction Act of 1980 (44 U.S.C 3501 et seq.) requires us to inform you that:

This information is being collected for use in calculating royalty payments and in verification of compliance with lease terms.

Response to this request is mandatory only if the lessee elects to mine, extract, remove and/or dispose of the leased deposits

APPENDIX B

CURRENT TRONA SITUATION ANALYSIS

APPENDIX B

CURRENT TRONA SITUATION ANALYSIS

GENERAL

Production of natural soda ash in the United States (US) and the world is dominated by sodium mined from southwest Wyoming. The extensive size and high quality of the Wyoming trona resource base has a well established mining, processing, and transportation infrastructure. This situation has created an industry with as little risk for production quantity, quality, and deliverability as exists for any major mineral commodity in the world. The trona industry is characterized by a small number of producers selling an interchangeable commodity to consumers. Most consumers could use any producer's product in their manufacturing since there is no appreciable product identification in this industry.

UNITED STATES

The Green River Basin is the world's largest producing area of natural soda ash. Its soda ash production capacity enables these producers to provide 27% of the total world output, including domestic needs in addition to exporting to several foreign countries. In addition to the Wyoming deposit, brine is processed to recover soda ash and other products at Searles Lake, California. Colorado has extensive nahcolite (sodium bicarbonate) deposits. The Colorado deposit is still in the commercial/pilot stage where solution mining techniques are being tested.

In the early 1980s, a recession, construction of one new Wyoming soda ash plant, expansion of other Wyoming soda ash plants, and expansion of the Searles plant in California all combined to create a large excess soda ash capacity problem in Wyoming. Following these developments, the Wyoming soda ash industry operated at below capacity. In 1992, Wyoming soda ash production increased to the highest level yet achieved. Wyoming production in 1994 was nearly the same as 1992.

WORLD

Historically, Western Europe has had a significant synthetic soda ash industry. Additionally, Russia and Eastern Block countries had developed a significant soda ash producing industry. With the changing political situation in Eastern Europe, solidification of the European Union (EU), high levels of economic growth in southeast Asia, and changing technology and shifting world trade patterns, the worldwide supply situation is in a state of flux. Antiquated synthetic soda ash plants, lower quality production facilities, small scale plants, and facilities using high cost materials have been closed. As the availability of government support for subsidized industries is being reduced in some countries, their capability to produce soda ash is likewise reduced. In contrast, other countries have pushed for an extensive domestic soda ash industry even though it may not be economically viable.

Total world soda ash production is 31.2 million metric tons per year and total world capacity is approximately 38 million tons per year. These indications of excess capacity, based on "nameplate" designations, must be evaluated in terms of the operating capacity for all aspects of soda ash production including problems caused by limitations of materials, supplies, labor, and availability of transportation. Many of these producing countries have large populations requiring large quantities of consumer products that use soda ash in their preparation.

China has run the gamut of being an importer of US soda ash to exporting soda ash. The expanding Chinese economy indicates that most of their domestic production may be consumed internally. In addition, soda ash quality is currently being upgraded to meet the needs of markets demanding a higher quality product.

Russia and adjacent countries had developed their soda ash industry using a variety of resource bases and technology but technological, environmental, and economic factors have forced reductions in output as well as consumption. Additionally, new capacity has been added in several countries and new production capability is projected to be added in Asia and the Mid-East. Some of the new production is from natural brine and solid minerals; however, many of these deposits are often of limited size, may be of variable quality, and require extensive infrastructure to be economically feasible.

It is evident that world supplies of both natural and synthetic soda ash are being maintained or enhanced. This is true in the US also where new mines are being developed and existing facilities expanded. Accordingly, there is need to make more federal sodium leases available. The major private trona lessor continues to lease sodium tracts to meet the these needs.

DEMAND

Product Description

Wyoming-produced soda ash is a very homogeneous product needed by many industries, especially the glass industry. This product is of high quality with minimal differences between producers. It has a very low level of impurities, especially those that are detrimental to either the equipment or the produced goods of the secondary process phase. In addition, the process to produce soda ash from a natural ore is far more environmentally desirable than having to dispose of large quantities of unwanted processing wastes, such as calcium chloride, that are the by-products of synthetic soda ash production.

In response to market demand, new facilities have been constructed in Wyoming to produce a wider variety of new products, such as: caustic soda, anhydrous sodium sulfite, sodium bicarbonate, sodium cyanide, and sodium phosphate.

Product Uses

The domestic market can be subdivided into major buyers by industry group and consumption: glass producers take 49% of the domestic production, chemical producers take 23%, the soap and detergent industry takes 13%, and other uses such as scrubbers and water treatment take up the remaining 15%. The substitution of plastics and metals in the food container industry and use of recycled glass is making a significant impact on the glass industry, which similarly reduces the market for soda ash.

Demand

US soda ash demand has been essentially flat for the last few years. At this time, the maturity of the US economy is a major factor determining domestic soda ash demand.

The world demand has had a ragged growth pattern of late, partly because of the economic downturn in Europe and the deterioration of Russian and adjacent countries' economies. World demand has been relatively flat the last five years. Soda ash is considered to be a mature chemical commodity whose demand tends to grow parallel to population trends. As countries develop their standard of living, their demand for soda ash increases significantly. The largest consumers of soda ash tend to be the developed countries; however, these countries have slower growth rates compared to developing countries.

The increase in the caustic soda price has caused an increase in worldwide demand of one million tons of soda ash (which can replace caustic soda); however, this increase is subject to market swings.

Price

The selling price of soda ash has been volatile over the past 15 years which was caused by several factors including increasing demand, cost impact of increased energy prices in the early 1980s along with environmental considerations. These factors caused the US synthetic soda ash producers to cease production thereby creating a substantial increase in demand for natural soda ash in the US. In response to increased demand for natural soda ash, prices increased to an all time high in 1981. As a result, more productive capacity was added including a new mine and processing plant. Subsequently, the demand slackened and prices fell in the remainder of the 1980s. Following higher prices in 1991, prices slid downward in 1992. In June, 1995, FMC announced a $15.00/ton off-list price and a $7.00/ton per ton price increase in soda ash, effective July 1,1995. All five producers have since announced they will increase the selling price similarly. These late price increases are attributable to several factors including general economic upturns throughout the world, including the US, Europe, and particularly in southeast Asia.

US INDUSTRY

The Wyoming trona industry is composed of five companies that produce 90% of the US soda ash, the remainder is produced from brine in California with a limited sodium bicarbonate industry in Colorado. Foreign interest in the Wyoming trona industry has risen from zero in 1980 to 57% in 1995, based on plant "nameplate" capacity. These foreign owners are primarily major users of soda ash or are chemical producers.

Regarding new developments in the US, Wold Trona Company was formed in 1993 with plans to develop a mine and construct a trona dry processing method facility that will have an annual capacity of 1.25 million tons of lower grade soda ash. Construction is planned as early as mid-1995, with production scheduled for late 1997. FMC announced in February 1995, that they would continue with the second phase of a two-phased project to increase capacity by 700,000 tons annually. The project is scheduled to be on line in 1997.

EXPORTS

US soda ash exports have increased from 19% in 1983 to 35% in 1994. Export marketing occurs through the American Natural Soda Ash Corporation (ANSAC) or directly by each producer. The US soda ash industry has three primary groups of countries to which it markets soda ash, the EU, Canada, and other countries through ANSAC.

US producers attempted to enter the EU market in Europe but were frustrated by imposition of import penalties. These penalties were rescinded in 1990 and the European market opened to US producers. Recognizing the impact on what had historically been their markets, the two major European producers implemented changes in their organizations by: corporate restructuring, reducing prices 10-15%, closing marginal plants, and acquiring, at least, partial ownership of Wyoming soda ash processing plants.

In 1993, through the European Chemical Industry Council, five of the six European synthetic soda ash producers submitted anti-dumping charges to the European Commission and in the latter half of the year, a formal investigation had begun. A decision was made by the EU Commission in April 1995 which included levied fines on each company ranging from 0 to 14.3%. In 1993, shipments to EU declined to 6% of exports compared to 13% in 1993.

The above factors will lessen the soda ash exports to the EU for the short-term. However, because of the higher cost structure of producing synthetic soda ash, it is doubtful that the European price can remain low for very long before it has an adverse financial effect on the producers. The European economy is now rebounding and a gradual reduction of import duties assigned to imports to the EU promulgated by the General Agreement on Trade and Tariffs, now the World Trade Commission, negotiations should assist US exporters by the end of the century.

Opportunities for export growth are most favorable in areas with modest population growth rates such as Indonesia, Mexico, the Philippines, Thailand, and Venezuela. Southeast Asian markets are growing as a result of economic and technical outreach initiatives launched by changes in the social and political institutions in those countries. The curtailment of the Botswana operation should open up the South African market to US marketers. These countries represent significant export potential in the future for US soda ash exports.

TRADE BARRIERS

Among the various aspects of foreign government protection, the most visible is the high duty applied to US products, increasing its cost and reducing its competitiveness in these foreign markets. While there has been movement toward free trade, there have been some negative movements as well. In some countries, import licensing is required and in a few countries the license agreement must be approved by the local producer, the US industry's competitor.

The World Trade Commission, the trade harmonizer, is scheduled to reduce chemical tariffs to 5.5% over various periods of time. Under this agreement the 10% duty on soda ash imports to the EU would be systematically reduced to 5.5% in 1999.

TRANSPORTATION

While Wyoming natural soda ash is inherently cheaper to produce than synthetic soda ash, US deposits are far removed from many of the major markets. Transportation costs are the largest cost component of soda ash delivered to foreign consumers. Wyoming soda ash is transported largely by railroad to ports on the west coast or the Gulf of Mexico where it is carried by ships to foreign ports and transported overland to its final destination. Major bulk unloading terminals have been installed at ports in the Pacific Northwest, transporting 70% of US exports to Asia, Europe, and South America; and at Port Arthur, Texas, shipping the remaining soda ash export mostly to South America. This additional cost limits Wyoming's very competitive production cost advantage in world markets.

APPENDIX C

FWS MEMORANDUM

(26)

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Ecological Services
4000 Morrie Avenue
Cheyenne, Wyoming 82001

OCT 1994
Received
Dept. of Interior
Bureau of
Land Management
Rock Springs,
Wyoming

IN REPLY REFER TO:

ES-61411
spb/W.02(rssodles.scp)

October 19, 1994

Memorandum

To: Chief, Branch of Solid Minerals, Bureau of Land Management, Rock Springs, Wyoming

From: Field Supervisor, Ecological Services, Cheyenne, Wyoming

Subject: Proposed Sodium Leasing within the Green River Basin

Thank you for your scoping statement on the subject proposal, received on September 15. I have concerns with the following issues and request that they receive full treatment in the analysis of this project.

1. Wetland Impacts: I am concerned that wetlands may be impacted by the proposed project. Because of the otherwise arid conditions in the Green River Basin, those existing wetlands are of inordinate importance to resident and migrating wildlife. In meeting its responsibilities for wetland protection and conservation, the Bureau of Land Management (Bureau) must assure that proposed activities do not result in the taking of any Federal trust wildlife resources nor lead to the contamination of other water sources. Action should be taken to avoid or mitigate any wetland losses in accordance with section 404 of the Clean Water Act, the Fish and Wildlife Coordination Act, Executive Order 11990 (wetland protection) and Executive Order 11988 (floodplain management). All wetlands in the project area should be inventoried and fully described in terms of functions and values. Acreage of wetlands, by type, should be disclosed and specific actions outlined to avoid, minimize, and compensate for unavoidable wetland impacts.

2. Endangered Species: In accordance with section 7(c) of the Endangered Species Act of 1973, as amended (ESA), the following threatened or endangered (T/E) species may be present in the project area.

SPECIES	**STATUS**	**EXPECTED OCCURRENCE**
Black-footed ferret (Mustela nigripes)	Endangered	Potential resident in prairie dog (Cynomys sp.) colonies.
Bald eagle (Haliaeetus leucocephalus)	Endangered	Winter resident. Migrant. Potential nesting.
Peregrine falcon	Endangered	Migrant.

(Falco peregrinus)		
Whooping crane (Grus americana)	Endangered	Migrant.
Ute ladies'-tresses (Spiranthes diluvialis)	Threatened	Known from floodplains of the Green River drainage downstream of Wyoming. Affected area should be surveyed.

If your proposed action will lead to water depletion (consumption) in the Colorado River System, you should include the following species in your evaluation:

Colorado squawfish (Ptychocheilus lucius)	Endangered	Downstream resident of Green River System.
Humpback chub (Gila cypha)	Endangered	"
Bonytail Chub (Gila elegans)	Endangered	"
Razorback sucker (Xyrauchen texanus)	Endangered	"

Candidate species that may occur within the project area are identified below. Many Federal agencies have policies to protect candidate species from further population declines. Our office would appreciate receiving any information available on the status of these species in or near the project area.

Species	**Category***	**Scientific Name**	**Expected Occurrence**
Mammals			
Preble's shrew	2	Sorex preblei	W. Wyoming, incl. Uinta Co.
Spotted bat	2	Euderma maculatum	Flaming Gorge
Pygmy rabbit	2	Brachylagus idahoensis	SW Wyoming
Birds			
White-faced ibis	2	Plegadis chihi	wetlands statewide
Ferruginous hawk	2	Buteo regalis	grasslands statewide
Mountain plover	1	Charadrius montanus	grasslands statewide
Long-billed curlew	3C	Numenius americanus	grasslands/wetlands
Black tern	2	Chlidonias niger	wetlands statewide
Loggerhead shrike	2	Lanius ludovicianus	woodlands/shrublands
Fish			
Flannelmouth sucker	2	Catostomus latipinnis	Green & Little Snake Rivers & tribs.

Roundtail chub	2	Gila robusta	Green & Little Snake River drainages.

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*1 = Federal T/E listing appears appropriate and is anticipated. 2 = Current data insufficient to support listing. 3C = More widespread or abundant than previously believed, or no immediate threats identified.

It is likely that candidate plant species also occur in the project area, although this office does not have recent survey reports from the area. We recommend that plant surveys be done prior to any leasing decisions.

Section 7(c) of ESA requires that Federal agencies proposing major construction actions complete a biological assessment to determine the effects of the proposed actions on listed species. If a biological assessment is not required (i.e., all other actions), the lead agency is responsible for review of proposed activities to determine whether listed species will be affected. I would appreciate the opportunity to review your determination document.

For those actions where a biological assessment is necessary, it should be completed within 180 days of initiation, but can be extended by mutual agreement between your agency and the Fish and Wildlife Service (Service). If the assessment is not initiated within 90 days, the list of T/E species should be verified with this office prior to initiation of the assessment. The biological assessment may be undertaken as part of the agency's compliance of section 102 of the National Environmental Policy Act (NEPA), and incorporated into the NEPA documents. The Service recommends that biological assessments include:

1. a description of the project;
2. a description of the specific area potentially affected by the action;
3. the current status, habitat use, and behavior of T/E species in the project area;
4. discussion of the methods used to determine the information in item 3;
5. direct and indirect impacts of the project to T/E species;
6. an analysis of the effects of the action on listed and proposed species and their habitats including cumulative impacts from Federal, State, or private projects in the area;
7. coordination measures that will reduce/eliminate adverse impacts to T/E species;
8. the expected status of T/E species in the future (short and long term) during and after project completion;
9. determination of "is likely to adversely affect" or "is not likely to adversely affect" for listed species;
10. determination of "is likely to jeopardize" or "is not likely to jeopardize" for proposed species;
11. citation of literature and personal contacts used in assessment.

If it is determined that any agency program or project "is likely to adversely affect" any listed species, formal consultation should be initiated with this office. If it is concluded that the project "is not likely to adversely affect" listed species, I should be asked to review the assessment and concur with the determination of no adverse effect.

A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare biological assessments. However, the ultimate responsibility for section 7 compliance remains with the Federal agency, and written notice should be provided to the Service upon such a designation. I recommend that Federal agencies provide their non-Federal representatives with proper guidance and oversight during preparation of biological assessments and evaluation of potential impacts to listed species.

Section 7(d) of ESA requires that the Federal agency and permit or license applicant not make any irreversible or irretrievable commitment of resources that would preclude the formulation of reasonable and prudent alternatives until consultation on listed species is completed.

3. Water Quality/Habitat Quality: I am concerned with water quality impacts of the proposed project, particularly with respect to their effects on fisheries, migratory birds, and Federally listed threatened or endangered species. The analysis should describe project activities that may affect water quality or that have the potential to expose fish and wildlife to hazardous substances. Such activities may include, but are not limited to: wastewater discharges, transportation of hazardous materials, spills, and evaporation ponds. Since selenium is a commonly detected trace element in Wyoming and has been detected in varying concentrations in ground and surface waters and soils, the analysis should assess, if appropriate, the project's potential to mobilize selenium and cause bioaccumulation in the food chain.

Evaporation ponds have resulted in the take of many protected birds in Wyoming. If evaporation or settling ponds will be used in the trona mining process, the Bureau should require netting to exclude birds and other wildlife.

4. Fish and Wildlife: Short-term and long-term impacts of the proposed project on fish and wildlife and their habitats should be given full treatment in the analysis. In addition to assessing impacts to T/E and candidate species, the analysis should address impacts to nesting raptors and other migratory birds.

5. Cumulative Effects: Accelerated petroleum and other mineral development in southwestern Wyoming has resulted in substantial impacts to wildlife habitats in the area. Further industrial development is likely to compound the problems, and may well result in reduced wildlife populations. The additive and synergistic effects of increased sodium mining, in combination with other existing and future developments, should be thoroughly evaluated. The effects of roads, increased human populations and presence, power lines, and other such effects must be included in the analysis.

These preliminary scoping comments are made pursuant to the National Environmental Policy Act, the Endangered Species Act and Fish and Wildlife Coordination Act. Please keep this office informed of any developments or decisions concerning this project. If you have any questions, please contact me or Steve Brockmann of my staff at the letterhead address or phone (307) 772-2374.

Charles P. Davis

cc: Director, WGFD, Cheyenne, WY
Nongame Coordinator, WGFD, Lander, WY

APPENDIX D

MINING DESCRIPTION

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All Wyoming trona is mined underground using modified and considerably beefed-up coal mining machinery to handle the harder, heavier, and more abrasive trona ore. Both room-and-pillar and longwall methods of mining are used. The mines are classified as gassy, and they must be well ventilated to prevent a buildup of methane gas which is associated with the oil shale layers intermingled with the trona beds. Rhône-Poulenc currently is mining trona between 800 and 1,000 feet below the surface, while General Chemical and FMC are operating at about 1,500 feet, and Texasgulf is mining at 1,370- and 1,420-foot depths. Solvay is mining trona at 1,600 feet below surface.

All trona mines in the Green River Basin are shaft mines (Figure D-1); the trona beds are reached by a vertical opening from the surface. Vertical shafts are used to bring trona out of the mine. Ground support (headframe) over the opening is dependent on various factors, including the length or depth of the opening, its intended lifetime and use, water and climatic conditions, and the nature of the strata exposed. The shafts are generally lined with concrete.

At least two and usually three shafts are needed for personnel entry, ore hoisting (production shaft), and ventilation. The shafts are about 16-22 feet in diameter and extend down 1,000 to 1,600 feet, depending on the depth of the ore beds. From 16,000 to 21,000 cubic yards of rock are removed during construction of each shaft and this material is generally used in the development of the plant site. In addition to shaft sinking, ore bins are excavated and other support facilities, such as headframe, hoists, underground transformer stations, underground primary crusher, permanent main line conveyor belt, and ventilation fans are constructed. Ventilation fans remove dust and gases from the mining operation and provide fresh air to the area being mined.

MINING SYSTEMS

Underground mining systems which can be used in modern trona mines are generally classified according to the equipment used, such as conventional, continuous, longwall, or shortwall. All of these systems were adapted from coal mining, since trona is only slightly harder that coal and is found in beds like coal. Conventional, continuous, and longwall methods are currently being used for trona mining in this area.

CONVENTIONAL

This system is presently being used by Rhône-Poulenc Chemical Company. In conventional mining systems, the trona is extracted in a sequence of operations. The trona face is undercut, center cut, or top cut, with a cutting machine (which resembles a large chain saw on wheels). The block or blocks of trona outlines are then drilled, using mobile powered drills, hand-held electric, or hydraulic drills. The holes are then charged with explosives and the trona is dislodged. The broken trona is gathered by a loading machine and then transported to the surface by either a shuttle car, or conveyor belt. Roof support (wooden timbers, steel crossbars and posts, or most commonly, roof bolts) is usually installed by machine. Ventilation is extended to the trona face and now the trona face is ready for the next cycle.

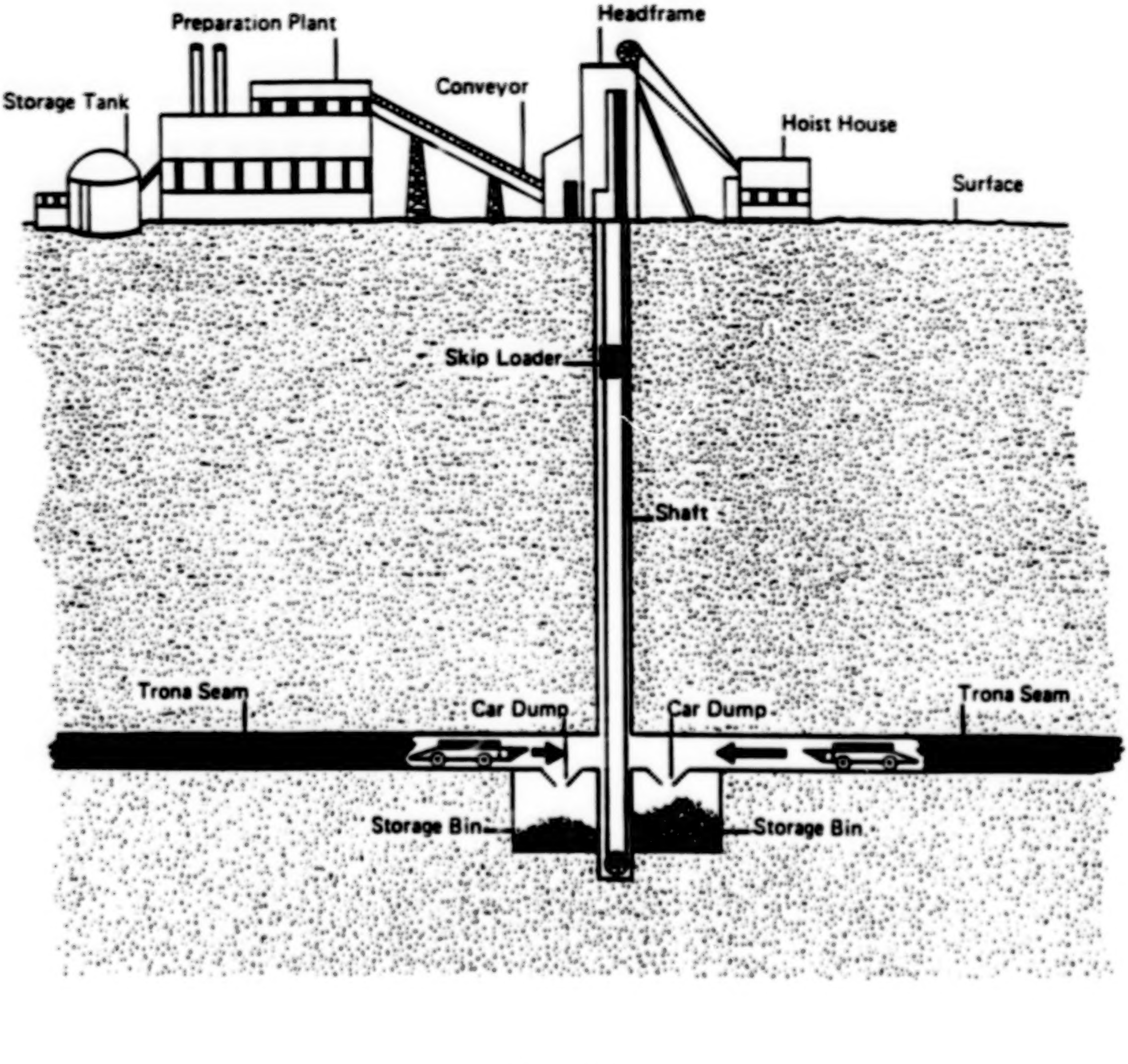


Figure D-1

SHAFT MINE

LONGWALL

This system is presently being used by FMC. In the longwall mining system, large blocks of trona are completely extracted in a single, continuous operation (Figure D-2). Hydraulic yielding jacks or self-advancing jack units (shield) support the roof at the immediate face as the trona is removed. As the face advances, the strata are allowed to cave behind the support units. The broken mineral is removed by the plowing action of the machine onto a chain-type conveyor.

Longwall mining machines fall into two general categories, plows (planers) and shearers (shearer-loaders). The shearer is the only type machine used to mine trona. The shearer is normally configured with a cutting drum on each end, which is powered to cut the trona the full height of the bed, and 30 inches deep and the full width of the longwall panel (about 500 feet). The shearer is capable of cutting either direction. Figure D-3 depicts a longwall operation.

MINING METHODS

DEVELOPMENT MINING

Development mining is also known as development work, or simply development, first mining, advance work, or solid work. The trona property to be worked is divided and subdivided into areas by driving sets of entries into the field of trona on an engineered pattern consistent with the proposed mining system (Figure D-4). It is common in current practice to drive eight or more entries (or headings) into the mine property to satisfy the long-term ventilation requirements.

The size of the entries varies, depending on the relative strength of the roof and the type and size of mining and transportation equipment to be employed.

If the selected mining system is conventional, continuous, or shortwall, development commonly follows a "room and pillar" plan. Sets of rooms (usually 4, 5, or 6 rooms, with appropriate crosscuts) are usually driven at 90° from the room entries. Each set of room entries or "panel," is normally separated from adjacent panels by a barrier of trona (usually equal to the pillar width used within the panel). The pillars left within each panel are of a size suitable for later recovery unless mining or economic conditions dictate only partial recovery.

If the selected mining system is longwall, parallel panels are driven from the cross entry, separated by a side barrier of solid trona. At a predetermined distance (in the U.S. this has been from 1,500 to 7,500 feet), the panels are cross-connected to outline the longwall face. Longwall mining faces in the U.S. range in length from about 300 to 650 feet (see Figures D-2 and D-3).

RETREAT MINING

When a given area has been developed, second mining or retreat mining is begun. The emphasis in present mining practice is definitely on retreat mining where a better recovery is achieved. Roof support costs are generally lower on retreat, and production rates are consistently higher. As in development mining, it is very important from the standpoint of safety and efficiency for the mining of pillar blocks to be done in a planned and orderly sequence.

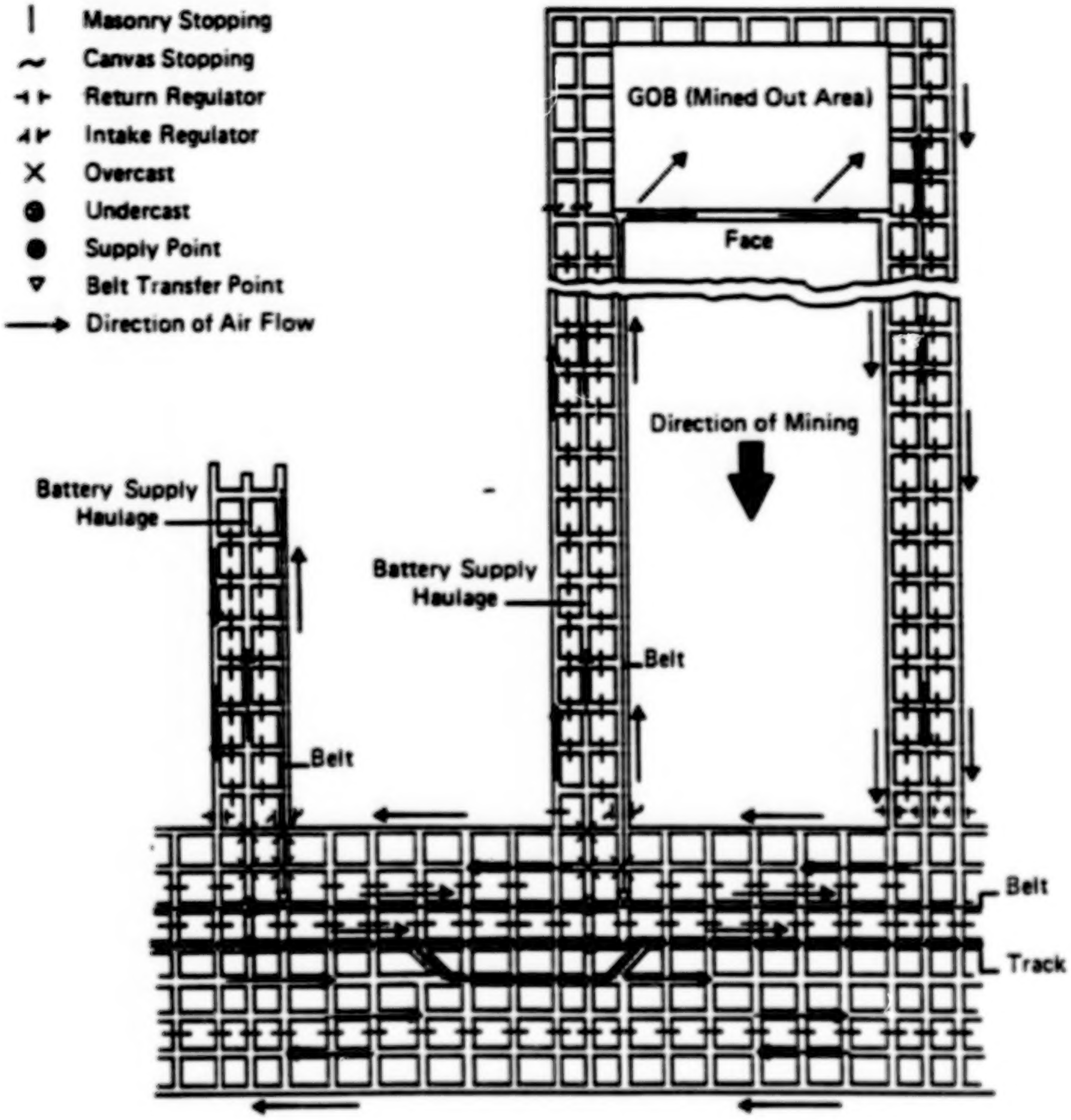


Figure D-2

PLAN FOR LONGWALL DEVELOPMENT
(Entries Driven by Continuous Miners)

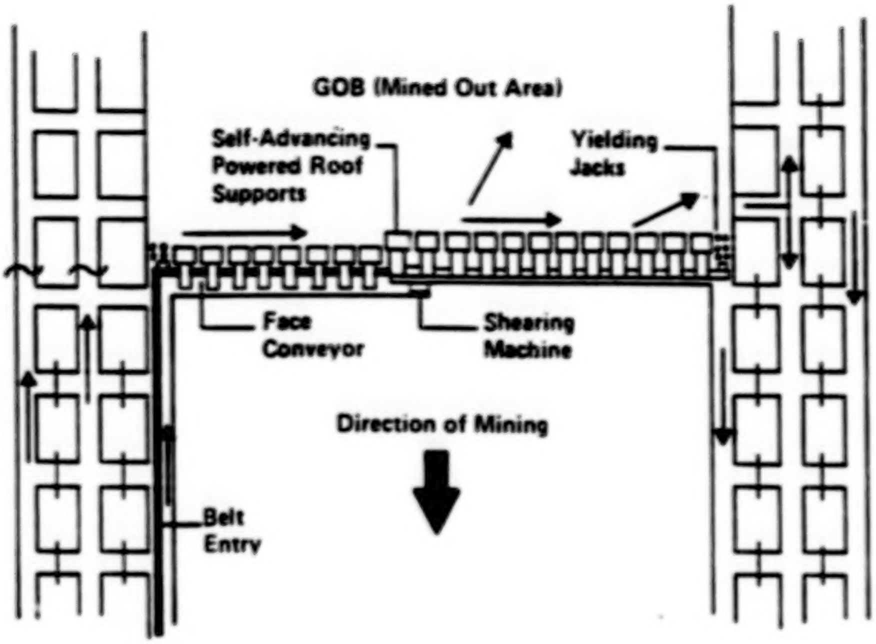
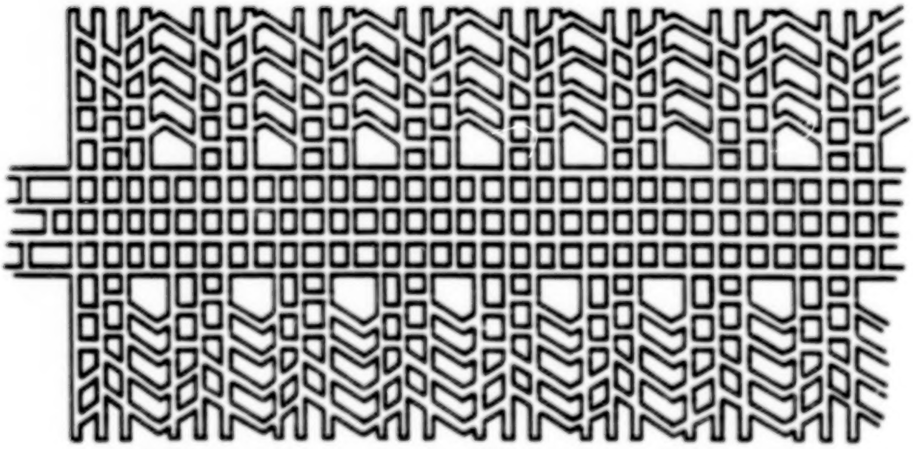


Figure D-3

PLAN OF LONGWALL FACE

Source: Schroder 1973



Development mining is one plan of mining where the surface must be supported. Usually the rooms are driven in sets on one side of the panel as the entries are driven, then the room sets are mined in sequence on the other side in retreat.

Figure D-4

DEVELOPMENT MINING PLAN

Complete extraction is the ideal choice, but there are circumstances under which this is not possible because of cost, mining conditions, the right to subside the surface, or legal restraints.

Even where a mine is practicing full recovery, blocks of trona must be left as support for surface features such as plants, ponds and roads, and unusually bad roof areas, locally severe dips, ventilation control between large panels, bleeder entry protection, boundaries with other mines or ownerships, oil and gas wells, and other reasons.

Under the best of conditions and mining practice, full recovery with pillar methods seldom averages more than 60%, or in the case of longwall retreating more than 85%. In partial mining the equivalent recovery is 40-60%.

SOLUTION MINING

Solution mining of sodium deposits within the Green River Basin will continue to grow as the shallower beds are mined out using mechanical mining methods. Solution mining involves the in-place dissolving of the trona which leaves cavities in an otherwise undisturbed host rock. A solvent is injected into the trona beds below the surface, forced through the trona bed and then out an exit line to the processing plant. The relative success of this method of mining is dependent upon the ease of solution, ground stability, and, in the case of multiple-well penetrations, establishing flow channels between injection and production wells. Presently no operator within the KSLA is mining trona using solution mining techniques although FMC has the capability to do so.

ANTICIPATED MILLING AND REFINING METHODS

It is expected that any new milling and refinery plants built would use the same process methods currently being employed, sesquicarbonate and monohydrate. General Chemical, Solvay, and Rhône-Poulenc are using the modern monohydrate process. FMC uses both sesquicarbonate and monohydrate processes, and Texasgulf uses sesquicarbonate.

In the monohydrate process, crude soda ash (the product after heating the mined ore) is the material dissolved; and then sodium carbonate monohydrate crystals are recovered from the solution. In the sesquicarbonate process, the crushed trona ore is dissolved and the sodium carbonate monohydrate crystals are recovered from the solution. The flow diagram in Figure D-5 illustrates the differences between the two processes involved in soda ash production. The potential emissions from the processing plant are particulates, sulfur dioxide, nitrogen oxides, carbon monoxide, and hydrocarbons. Those pollutants usually exceed the emission rate by greater than 250 tons per year.

SURFACE STRUCTURES AND FACILITIES

Surface facilities include a processing plant, steam plant (usually coal-fired), water treatment plant, hoist house, mine headframes, ore and coal storage buildings, cooling towers, product storage silos, load out stations, conveyor transfer system, change houses, offices, warehouse area, machinery repair shop, laboratory, heater house, and other miscellaneous small structures. Surface facilities (excluding tailings and containment ponds) usually cover approximately 70 acres of land.

Other support facilities would include a tailing disposal pond, a water runoff containment pond, a sanitary sewer stabilization pond, and a sanitary landfill for solid waste disposal.

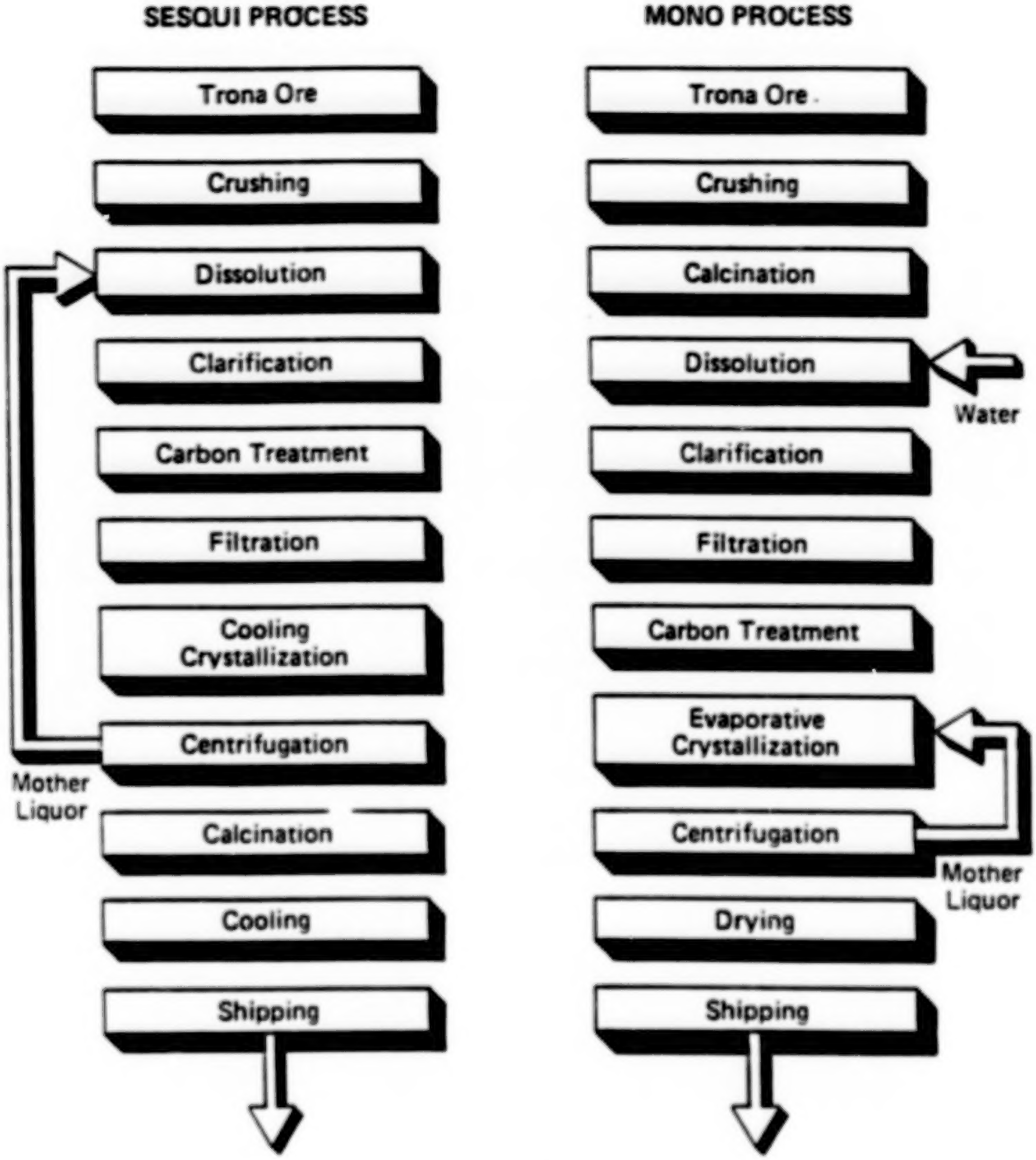


Figure D–5

COMPARISON OF SESQUICARBONATE AND MONOHYDRATE ROUTES FOR PRODUCTION OF SODA ASH FROM TRONA ORE

WASTE DISPOSAL

A tailings pond covering about 200 acres of surface area is needed to support the operation of a one million ton per year soda ash plant. Approximately 420 gallons per minute of slurry and liquids would be pumped into the pond and is the method used by all present operations. These ponds are self-contained with all water being eliminated by evaporation. Three of the five operators are also injecting tailings back into mined out areas underground in order to reduce environmental effects of surface disposal of tailings.

The containment pond will collect the runoff in the plant area from sloping drainage ditches that run adjacent to access ways and around the temporary ore stockpile. Liquid effluent from the mine, consisting of water obtained when permeable sandstone is penetrated by shafts or mining operations, would be pumped to the containment pond. Collected water would be reused in the process plant. There would be no discharge from the pond other than evaporation.

A sanitary sewage stabilization pond would be used to contain all sewage generated by plant operations. There would be no discharge from this pond, other than evaporation.

A sanitary landfill covering approximately 2 acres would be needed to dispose of solid waste generated by plant operations.

RECLAMATION

Detailed site-specific reclamation plans have been developed and are updated concurrently with the five-year mining plans for the existing soda ash operations. Any proposed operations would have to submit and obtain approval for a site-specific reclamation plan prior to commencing operation.

ANTICIPATED RECLAMATION METHODS

All surface area disturbed will be contoured and revegetated upon termination of that area's use with the exception of the tailings ponds. Sanitary landfills would be reclaimed as they are filled. All surface structures would be removed upon termination of operations. Rights-of-way such as powerlines, pipelines, communication lines, etc., would be reclaimed upon completion of their installation. Tailings ponds would not be reclaimed upon completion of plant operations because at present it is believed to be infeasible due to the lack of technological procedures. Should feasible means to reclaim these ponds become available, they would be incorporated into the applicable mining/reclamation plan. Tailings would be pumped into mined-out areas in stages and the test monitored for distribution, control, ground support, leakage and other parameters. Such tests could not begin until a suitable area has been mined out.

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